



(Copies to: Public Works Director, City Planner, Building Official
City Engineer and attached to NFIP map in City Clerk's
Office 9/11/1991)

Federal Emergency Management Agency

Region I

J.W. McCormack Post Office &
Courthouse Building, Room 442
Boston, MA 02109

September 9, 1991

IN REPLY REFER TO: RI-218-70-R

Joseph Hewes, P.E.
104 Westerly Terrace
Hartford, CT 06105

Dear Mr. Hewes:

This is in response to your letter dated July 15, 1991 on behalf of Henrietta Martin, requesting that the Federal Emergency Management Agency (FEMA) determine whether the following property is located in a Special Flood Hazard Area (SFHA), an area that would be inundated by the 100-year (one-percent annual chance) flood.

Property Description: Recorded in Bristol Land Records
Volume 993, Page 412

Street Address: 515 Broad Street, Lot No. 71-5

Community: Bristol

State: Connecticut

On August 14, 1991, we received all information necessary to process your request. After comparing this information with the National Flood Insurance Program (NFIP) map for Bristol, Connecticut, we determined that although portions of the property would be inundated by a 100-year flood, the existing structure on this property would not. Therefore, this letter amends the map for Bristol, Connecticut NFIP Map Number 090023 Panel number 0007B, dated November 18, 1981 to remove this structure from the SFHA. Because portions of the property are in the SFHA, any future construction or substantial improvement on this property remains subject to Federal, State, and local regulations for floodplain management.

Please note that this property could be inundated by a flood greater than a 100-year flood or by local flooding conditions not shown on the NFIP map. Flood insurance is available at reduced cost for properties located outside the SFHA. Also, although we have based our determination on the flood information presently available, flood conditions may change or new information may be generated that could supersede this determination.

RECEIVED
SEP 11 1 56 PM '91
TOWN OF BRISTOL, CT
BRISTOL, CONN.

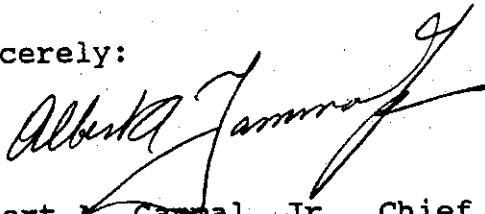
If this structure is covered by a flood insurance policy, and if the mortgage company or lending institution agrees to waive the flood insurance requirement, then the NFIP will refund the premium paid for the current policy year, providing that no claim is pending or has been paid on the policy during the current policy year. To receive the refund, a written waiver or certificate must be obtained from the mortgage company or lending institution. This written waiver or certificate must then be sent to the insurance agent, who will process the premium refund.

This response to your request is based on minimum criteria established by the NFIP. State and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the floodplain. If the State of Connecticut or the City of Bristol has adopted more restrictive and comprehensive floodplain management criteria, those criteria take precedence over the minimum Federal criteria.

A copy of this Letter of Map Amendment is being sent to your community's official map repository where, in accordance with regulations adopted by the community when it made application to join the NFIP, it will be attached to the community's official copy of the NFIP map which is available for public inspection.

If you have any questions or if we can be of further assistance, please contact us by phone at (617) 223-9561.

Sincerely:



Albert A. Gammal, Jr., Chief
Natural and Technological Hazards Division

cc: City of Bristol, Connecticut



Federal Emergency Management Agency

Washington, D.C. 20472

June 11, 2008

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Arthur Ward
Mayor, City of Bristol
City Hall
111 North Main Street
Bristol, CT 06010

IN REPLY REFER TO:

Case No.: 08-01-0505P
Community Name: City of Bristol, CT
Community No.: 090023
Effective Date of
This Revision: **June 11, 2008**

Dear Mayor Ward:

The Flood Insurance Study report, Flood Insurance Rate Map, and Flood Boundary and Floodway Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Boston, Massachusetts, at (617) 832-4761, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Sincerely,

Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

For: William R. Blanton Jr., CFM, Chief
Engineering Management Branch
Mitigation Directorate

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Boundary and Floodway Map
Annotated Flood Insurance Study Report

cc: Mr. Paul Strauderman
Engineer for the City of Bristol

Mr. Henri R. Martin
Broad Development Group of Bristol, LLC

Mr. Thomas Bulzak
EcoDesign, LLC



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Bristol Hartford County Connecticut	NONE	FLOODWAY HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA UPDATE
	COMMUNITY NO.: 090023		
IDENTIFIER	531 Broad Street	APPROXIMATE LATITUDE & LONGITUDE: 41.671, -72.918 SOURCE: USGS QUADRANGLE DATUM: NAD 27	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 090023 0007 B DATE: November 18, 1981 TYPE: FBFM** NO.: 090023 0007 DATE: November 18, 1981		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: May 18, 1981 PROFILE(S): 02P FLOODWAY DATA TABLE: 2	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Pequabuck River – from approximately 100 feet downstream to approximately 600 feet upstream of Broad Street

SUMMARY OF REVISIONS

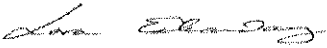
Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Pequabuck River	Zone A1-A30	Zone A1-A30	NONE	YES
	BFEs*	BFEs	NONE	YES
	Floodway	Floodway	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

112553 10.3.1.08010505 102-D-A



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report, FIRM, and FBFM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



Federal Emergency Management Agency
Washington, D.C. 20472

**LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)**

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Kevin Merli
Director, Mitigation Division
Federal Emergency Management Agency, Region I
99 High Street, Sixth Floor
Boston, MA 02110
(617) 832-4761

STATUS OF THE COMMUNITY NFIP MAPS

We are processing a revised FIRM and FIS report for Hartford County in our countywide format; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time.

Preliminary copies of the countywide FIRM and FIS report, which present information from the effective FIRMs, FBFMs, and FIS reports for your community and other incorporated communities in Hartford County, were submitted to your community for review on May 31, 2007. We will incorporate the modifications made by this LOMR into the countywide FIRM and FIS report before they become effective.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Pequabuck River								
A	0.046	550	1,723	5.1	198.0	198.0	198.6	0.6
B	0.306	340	1,317	6.7	202.2	202.2	202.2	0.0
C	0.602	125	893	9.9	208.5	208.5	208.7	0.2
D	0.887	580	4,078	1.8	216.4	216.4	216.4	0.0
E	1.173	290	767	7.3	219.7	219.7	219.9	0.2
F	1.318	350	1,298	4.3	222.0	222.0	222.9	0.9
G	1.375	85	523	10.7	224.5	224.5	224.5	0.0
H	1.432	150	810	6.9	226.6	226.6	226.7	0.1
I	1.704	51	379	14.8	233.1	233.1	233.5	0.4
J	1.733	79	710	7.9	236.9	236.9	237.1	0.2
K	1.900	60	532	10.5	239.6	239.6	239.9	0.3
L	2.043	75	589	9.5	243.8	243.8	244.1	0.3
M	2.216	170	1,046	5.3	256.4	256.4	256.4	0.0
N	2.469	300	1,524	3.7	265.2	265.2	265.2	0.0
O	2.840	80	426	13.1	275.5	275.5	275.5	0.0
P	3.217	230	676	8.0	293.1	293.1	293.1	0.0
Q	3.644	60	692	6.1	313.1	313.1	313.2	0.1
R	3.993	60	368	11.4	328.0	328.0	328.0	0.0
S	4.201	220	1,126	3.7	352.0	352.0	352.5	0.5
REVISED BY LOMR EFFECTIVE MARCH 16, 1998					REVISED TO REFLECT LOMR EFFECTIVE: June 11, 2008			
REVISED DATA								

¹ Miles above corporate limits

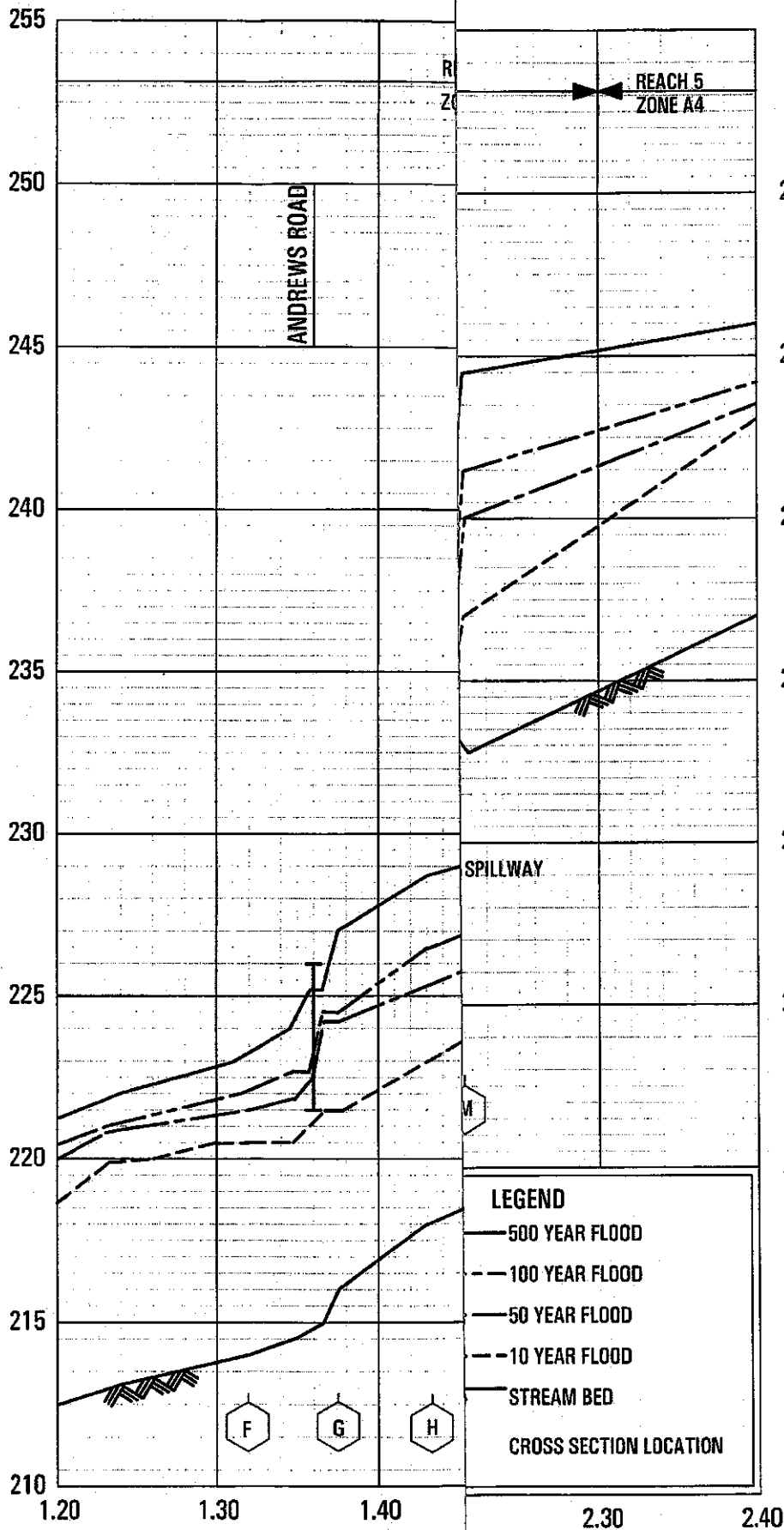
FEDERAL EMERGENCY MANAGEMENT AGENCY
CITY OF BRISTOL, CT
(HARTFORD CO.)

FLOODWAY DATA

PEQUABUCK RIVER

TABLE 2

ELEVATION IN FEET (NGVD)



FLOOD PROFILES

PEQUABUCK RIVER

REVISED TO
REFLECT LOMR

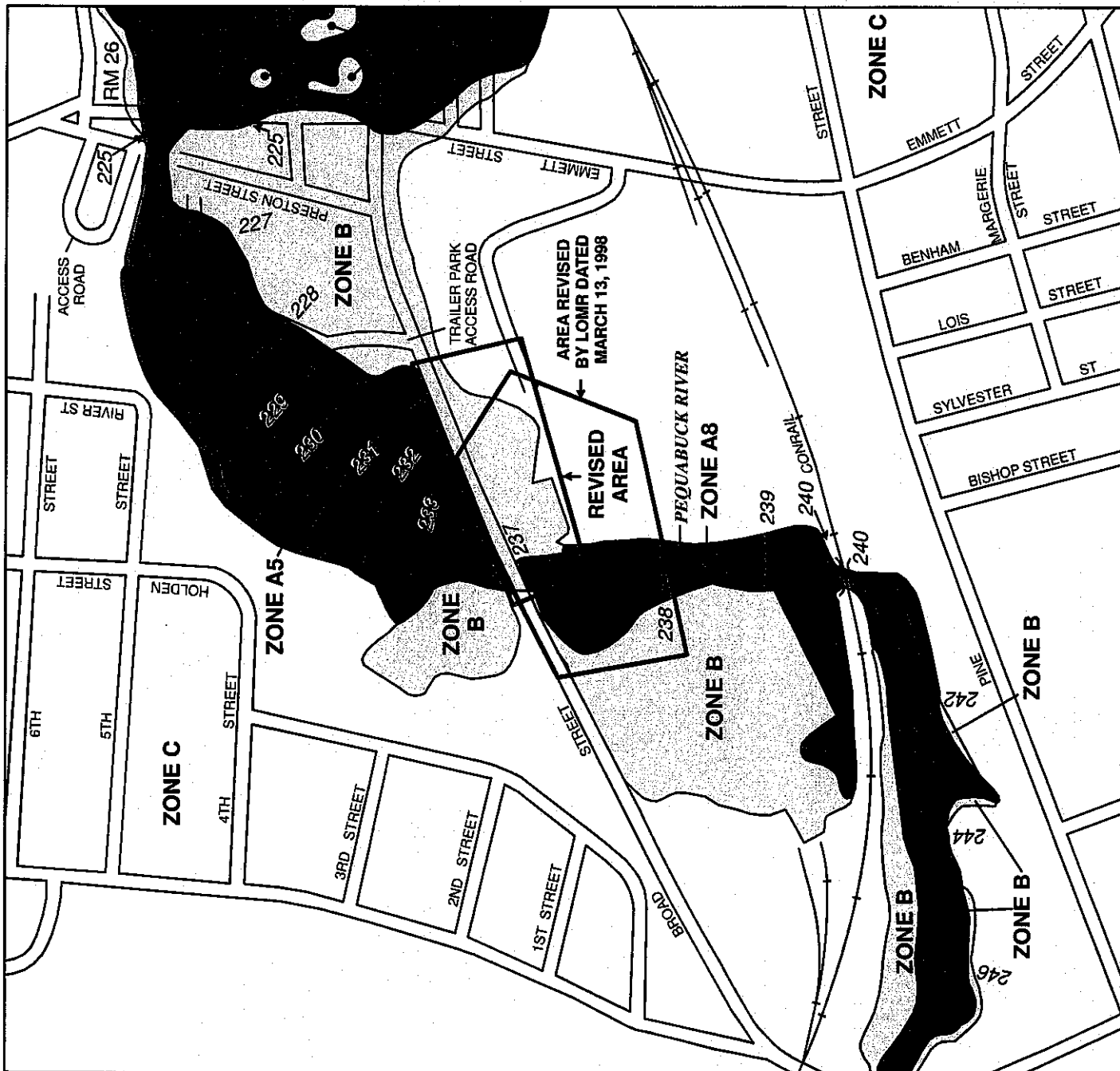
EFFECTIVE: June 11, 2008

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF BRISTOL, CT

(HARTFORD CO.)

02P



Legend

- 1% annual chance (100-Year) Floodplain
- 0.2% annual chance (500-Year) Floodplain

All Elevations Referenced in NGVD 29



MAP SCALE 1" = 400'

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
BRISTOL,
CONNECTICUT
HARTFORD COUNTY

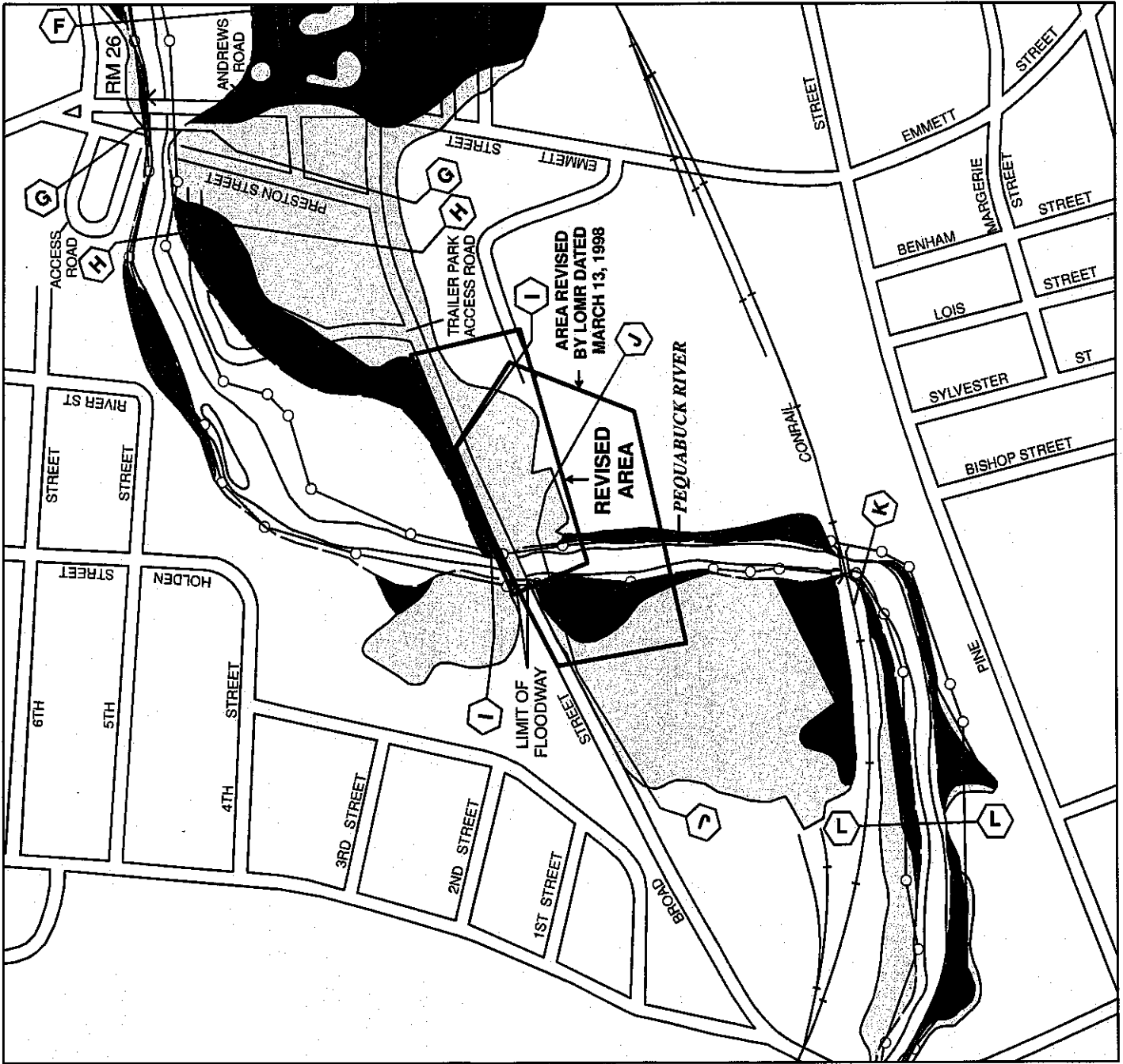
PANEL 7 OF 10
(SEE MAP INDEX FOR PANELS NOT PRINTED)

**REVISED TO
REFLECT LOMR
EFFECTIVE: June 11, 2008**

COMMUNITY-PANEL NUMBER
090023 0007 B

EFFECTIVE DATE:
NOVEMBER 18, 1931

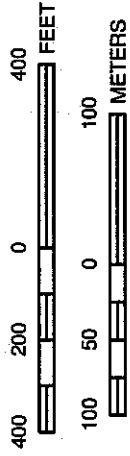
Federal emergency management agency
Federal Insurance Administration



Legend

- 1% annual chance (100-Year) Floodplain
- 1% annual chance (100-Year) Floodway
- 0.2% annual chance (500-Year) Floodplain

All Elevations Referenced in NGVD 29



MAP SCALE 1" = 400'

NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY
FLOOD BOUNDARY AND
FLOODWAY MAP

CITY OF
BRISTOL,
CONNECTICUT
HARTFORD COUNTY

PANEL 7 OF 10
(SEE MAP INDEX FOR PANELS NOT PRINTED)

**REVISED TO
REFLECT LOMR
EFFECTIVE: June 11, 2008**

COMMUNITY-PANEL NUMBER
090023 0007

EFFECTIVE DATE:
NOVEMBER 18, 1981

federal emergency management agency
federal insurance administration



Federal Emergency Management Agency

Washington, D.C. 20472

June 11, 2008

unt

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Arthur Ward
Mayor, City of Bristol
City Hall
111 North Main Street
Bristol, CT 06010

IN REPLY REFER TO:

Case No.: 08-01-0505P
Community Name: City of Bristol, CT
Community No.: 090023
Effective Date of
This Revision: June 11, 2008

Dear Mayor Ward:

The Flood Insurance Study report, Flood Insurance Rate Map, and Flood Boundary and Floodway Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

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Sincerely,

Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

For: William R. Blanton Jr., CFM, Chief
Engineering Management Branch
Mitigation Directorate

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Boundary and Floodway Map
Annotated Flood Insurance Study Report

cc: Mr. Paul Strauderman
Engineer for the City of Bristol

Mr. Henri R. Martin
Broad Development Group of Bristol, LLC

Mr. Thomas Bulzak
EcoDesign, LLC

RECEIVED
2008 JUN 17 PM 2:31
PUBLIC WORKS DEPT.



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Bristol Hartford County Connecticut	NONE	FLOODWAY HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA UPDATE
	COMMUNITY NO.: 090023		
IDENTIFIER	531 Broad Street	APPROXIMATE LATITUDE & LONGITUDE: 41.671, -72.918 SOURCE: USGS QUADRANGLE DATUM: NAD 27	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 090023 0007 B DATE: November 18, 1981 TYPE: FBFM** NO.: 090023 0007 DATE: November 18, 1981		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: May 18, 1981 PROFILE(S): 02P FLOODWAY DATA TABLE: 2	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Pequabuck River – from approximately 100 feet downstream to approximately 600 feet upstream of Broad Street

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Pequabuck River	Zone A1-A30	Zone A1-A30	NONE	YES
	BFEs*	BFEs	NONE	YES
	Floodway	Floodway	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

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Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

112553 10.3.1.08010505 102-D-A



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

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Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

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Mr. Kevin Merli
Director, Mitigation Division
Federal Emergency Management Agency, Region I
99 High Street, Sixth Floor
Boston, MA 02110
(617) 832-4761

STATUS OF THE COMMUNITY NFIP MAPS

We are processing a revised FIRM and FIS report for Hartford County in our countywide format; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the countywide FIRM and FIS report, which present information from the effective FIRMs, FBFMs, and FIS reports for your community and other incorporated communities in Hartford County, were submitted to your community for review on May 31, 2007. We will incorporate the modifications made by this LOMR into the countywide FIRM and FIS report before they become effective.

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Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

112553 10.3.1.08010505 102-D-A



Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

PUBLIC NOTIFICATION

FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD 29)		MAP PANEL NUMBER(S)
		EFFECTIVE	REVISED	
Pequabuck River	Just upstream of Broad Street	238	237	0007 B

Within 90 days of the second publication in the local newspaper, any interested party may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. This revision is effective as of the date of this letter. However, until the 90-day period has elapsed, the revised BFEs presented in this LOMR may be changed.

A notice of changes will be published in the *Federal Register*. A short notice also will be published in your local newspaper on or about the dates listed below. Please refer to FEMA's website at https://www.floodmaps.fema.gov/fhm/Scripts/bfe_main.asp for a more detailed description of proposed BFE changes, which will be posted within a week of the date of this letter.

LOCAL NEWSPAPER Name: *Hartford Courant*
Dates: 06/25/08 07/02/08

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NGVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Pequabuck River								
A	0.046	550	1,723	5.1	198.0	198.0	198.6	0.6
B	0.306	340	1,317	6.7	202.2	202.2	202.2	0.0
C	0.602	125	893	9.9	208.5	208.5	208.7	0.2
D	0.887	580	4,078	1.8	216.4	216.4	216.4	0.0
E	1.173	290	767	7.3	219.7	219.7	219.9	0.2
F	1.318	350	1,298	4.3	222.0	222.0	222.9	0.9
G	1.375	85	523	10.7	224.5	224.5	224.5	0.0
H	1.432	150	810	6.9	226.6	226.6	226.7	0.1
I	1.704	51	379	14.8	233.1	233.1	233.5	0.4
J	1.733	79	710	7.9	236.9	236.9	237.1	0.2
K	1.900	60	532	10.5	239.6	239.6	239.9	0.3
L	2.043	75	589	9.5	243.8	243.8	244.1	0.3
M	2.216	170	1,046	5.3	256.4	256.4	256.4	0.0
N	2.469	300	1,524	3.7	265.2	265.2	265.2	0.0
O	2.840	80	426	13.1	275.5	275.5	275.5	0.0
P	3.217	230	676	8.0	293.1	293.1	293.1	0.0
Q	3.644	60	692	6.1	313.1	313.1	313.2	0.1
R	3.993	60	368	11.4	328.0	328.0	328.0	0.0
S	4.201	220	1,126	3.7	352.0	352.0	352.5	0.5
REVISED BY LOMR EFFECTIVE MARCH 16, 1998					REVISED TO REFLECT LOMR EFFECTIVE: June 11, 2008			
REVISED DATA								

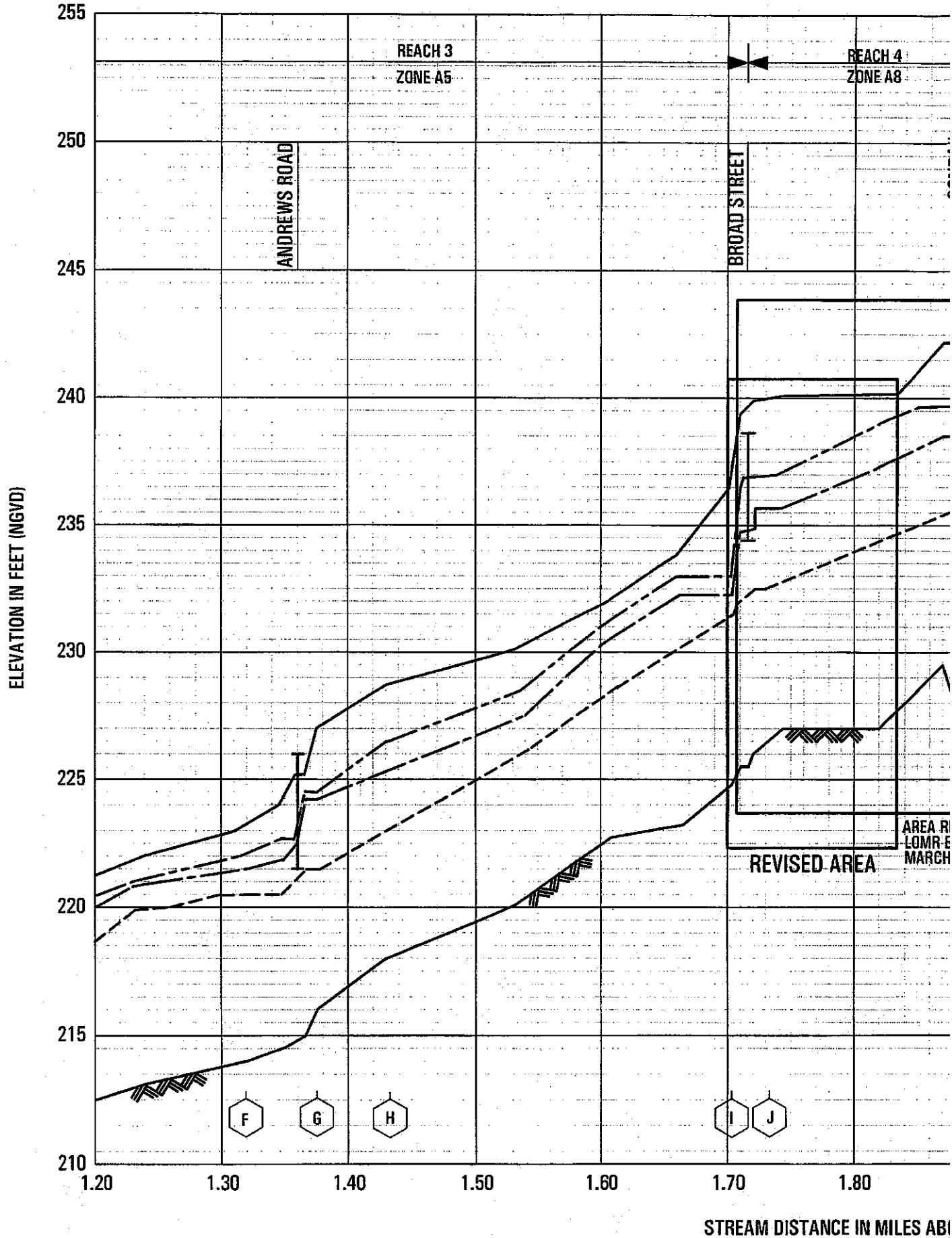
¹ Miles above corporate limits

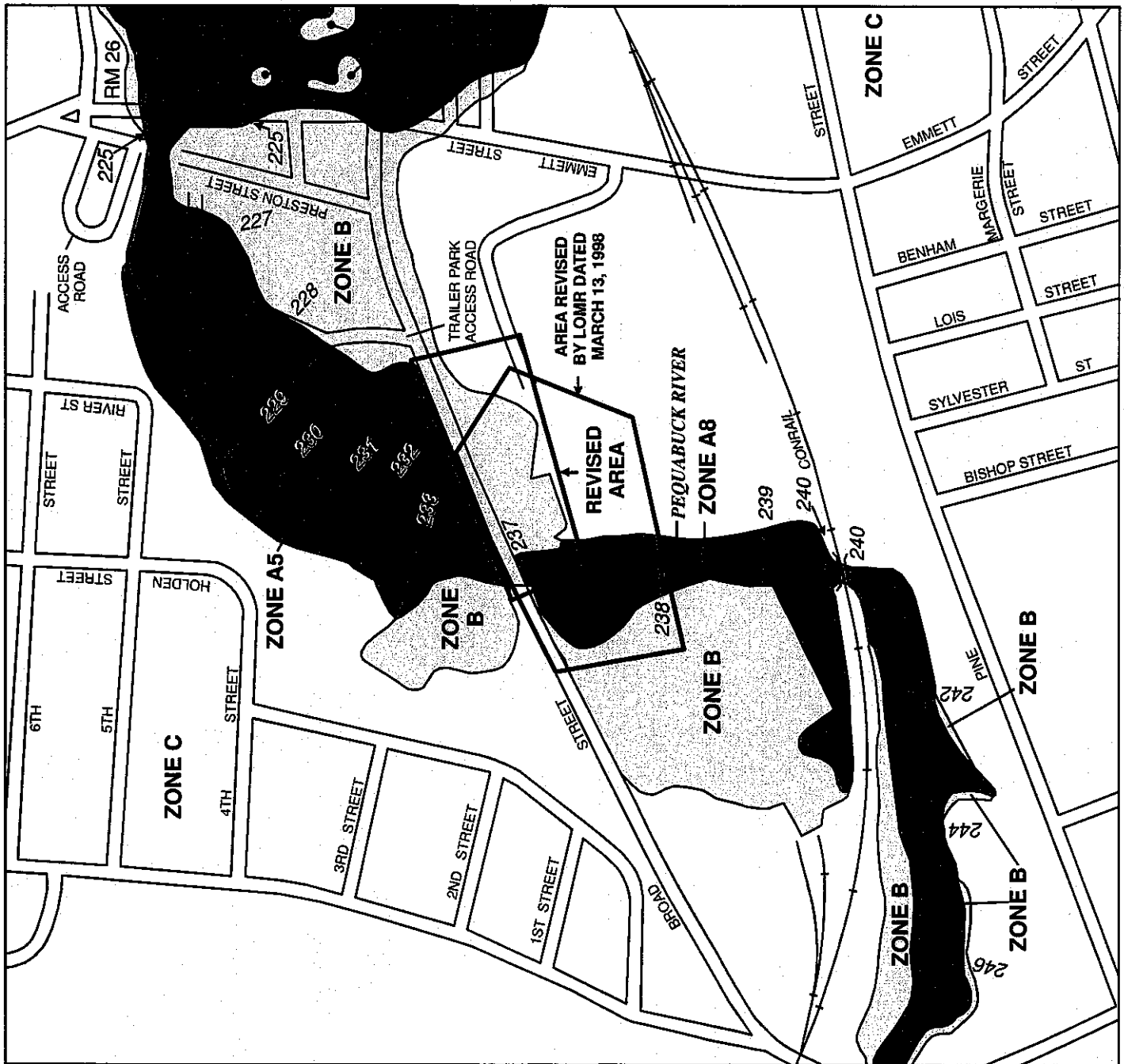
FEDERAL EMERGENCY MANAGEMENT AGENCY
CITY OF BRISTOL, CT
(HARTFORD CO.)

FLOODWAY DATA

PEQUABUCK RIVER

TABLE 2





Legend

1% annual chance
(100-Year) Floodplain

0.2% annual chance
(500-Year) Floodplain

All Elevations Referenced in NGVD 29



MAP SCALE 1" = 400'

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP


CITY OF
BRISTOL,
CONNECTICUT
HARTFORD COUNTY

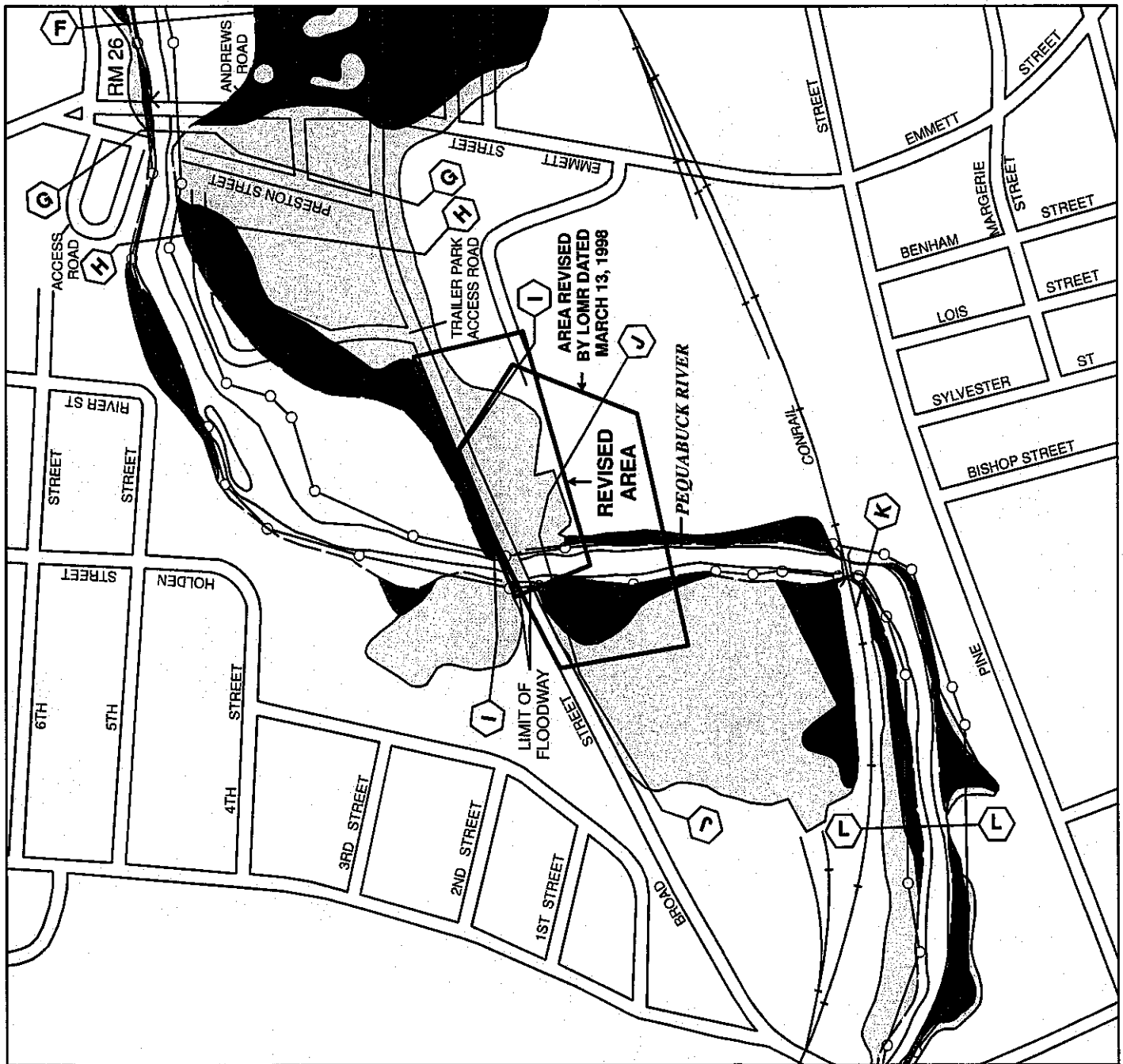
PANEL 7 OF 10
USE MAP INDEX FOR PANELS NOT PRINTED

**REVISED TO
REFLECT LOMR
EFFECTIVE: June 11, 2008**

COMMUNITY-PANEL NUMBER
090023 0007 B

EFFECTIVE DATE:
NOVEMBER 18, 1931

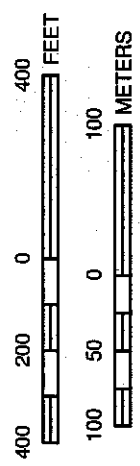
 federal emergency management agency
federal insurance administration



Legend

- 1% annual chance (100-Year) Floodplain
- 1% annual chance (100-Year) Floodway
- 0.2% annual chance (500-Year) Floodplain

All Elevations Referenced in NGVD 29



MAP SCALE 1" = 400'

NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY
FLOOD BOUNDARY AND
FLOODWAY MAP

CITY OF
BRISTOL,
CONNECTICUT
HARTFORD COUNTY

PANEL 7 OF 10
SEE MAP INDEX FOR PANELS NOT PRINTED

**REVISOR TO
REFLECT LOMR
EFFECTIVE: June 11, 2008**

COMMUNITY-PANEL NUMBER
090023 0007

EFFECTIVE DATE:
NOVEMBER 18, 1981

FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION



Federal Emergency Management Agency

Washington, D.C. 20472

October 31, 2008

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable Arthur Ward
Mayor, City of Bristol
City Hall
111 North Main Street
Bristol, CT 06010

IN REPLY REFER TO:

Case No.: 09-01-0019P
Community Name: City of Bristol, CT
Community No.: 090023
Effective Date of
This Revision: **October 31, 2008**

Dear Mayor Ward:

The Flood Insurance Study report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Boston, Massachusetts, at (617) 832-4761, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Sincerely,

Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

For: William R. Blanton Jr., CFM, Chief
Engineering Management Branch
Mitigation Directorate

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: Mr. Paul Strauderman
Engineer for the City of Bristol

Mr. Henri R. Martin
Broad Development Group of Bristol, LLC

Mr. Thomas Bulzak
EcoDesign, LLC



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Bristol Hartford County Connecticut	NO PROJECT	FLOODWAY HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA UPDATE
	COMMUNITY NO.: 090023		
IDENTIFIER	531 Broad Street	APPROXIMATE LATITUDE & LONGITUDE: 41.671, -72.918 SOURCE: USGS QUADRANGLE DATUM: NAD 27	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 09003C0466 F DATE: September 26, 2008		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: September 26, 2008 PROFILE(S): 297P FLOODWAY DATA TABLE: 16	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FFBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

Pequabuck River -- from approximately 100 feet downstream to approximately 600 feet upstream of Broad Street

SUMMARY OF REVISIONS

A Letter of Map Revision (LOMR) dated June 11, 2008 (Case No. 08-01-0505P), was issued to revise BFEs* along the Pequabuck River in the vicinity of Broad Street. The revised BFEs from that LOMR were not incorporated into the Flood Insurance Study (FIS) report for Hartford County, Connecticut (All Jurisdictions), which became effective on September 26, 2008. This LOMR revises and supersedes the affected portions of the September 26 Hartford County FIS report and is effective as of the date of this letter.

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a LOMR for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the FIS report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.


COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)


We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Kevin Merli
Director, Mitigation Division
Federal Emergency Management Agency, Region I
99 High Street, Sixth Floor
Boston, MA 02110
(617) 832-4761

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

This revision is effective as of the date of this letter. Any requests to review or alter this determination should be made within 30 days and must be based on scientific or technical data.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.


Lora S. Eskandary, CFM, Program Specialist
Engineering Management Branch
Mitigation Directorate

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Pequabuck River (continued)								
AA	34,556	340	1,317	6.7	201.4	201.4	201.4	0.0
AB	36,119	125	893	9.9	207.7	207.7	207.9	0.2
AC	37,623	580	4,078	1.8	215.6	215.6	215.6	0.0
AD	39,133	290	767	7.3	218.9	218.9	219.1	0.2
AE	39,899	350	1,298	4.3	221.2	221.2	222.1	0.9
AF	40,200	85	523	10.7	223.7	223.7	223.7	0.0
AG	40,501	150	810	6.9	225.8	225.8	225.9	0.1
AH	41,909	53	393	14.2	232.5	232.5	232.7	0.2
AI	42,097	79	710	7.9	236.1	236.1	236.3	0.2
AJ	42,972	60	532	10.5	238.8	238.8	239.1	0.3
AK	43,727	75	589	9.5	243.0	243.0	243.3	0.3
AL	44,640	170	1,046	5.3	255.6	255.6	255.6	0.0
AM	45,976	300	1,524	3.7	264.4	264.4	264.4	0.0
AN	47,935	80	426	13.1	274.7	274.7	274.7	0.0
AO	49,926	230	676	8.0	292.3	292.3	292.3	0.0
AP	52,180	60	692	6.1	312.3	312.3	312.4	0.1
AQ	54,023	60	368	11.4	327.2	327.2	327.2	0.0
AR	55,121	220	1,126	3.7	351.2	351.2	351.7	0.5
AS	56,252	115	479	8.7	356.0	356.0	356.0	0.0
AT	57,672	75	377	11.1	373.1	373.1	373.1	0.0
AU	58,781	50	338	12.4	391.0	391.0	391.0	0.0
AV	60,280	35	249	13.5	411.1	411.1	411.1	0.0
AW	61,542	60	286	11.8	425.6	425.6	425.6	0.0
AX	62,720	65	308	11.0	443.7	443.7	443.7	0.0
AY	63,427	70	328	10.3	457.6	457.6	457.7	0.1
AZ	65,185	55	279	12.1	504.8	504.8	504.8	0.0

↑
REVISED
DATA

¹Feet above confluence with Farmington River

REVISED TO
REFLECT LOMR
EFFECTIVE: October 31, 2008

FEDERAL EMERGENCY MANAGEMENT AGENCY

**HARTFORD COUNTY, CT
(ALL JURISDICTIONS)**

FLOODWAY DATA

PEQUABUCK RIVER

TABLE 16

ELEVATION (FEET NAVD 88)

255

250

245

240

235

230

225

220

215

210

ANDREWS ROAD

BROAD STREET

REVISED AREA

AE

AF

AG

AH

AI

STREAM DISTANCE IN MILES ABOVE CORPO

1.20

1.30

1.40

1.50

1.60

1.70

1.80



NATIONAL FLOOD INSURANCE PROGRAM

FEMA NATIONAL SERVICE PROVIDER

February 29, 2008

Mr. Thomas Bulzak, P.E., L.S.
EcoDesign, LLC
Four Whitfield Heights
Avon, CT 06001

IN REPLY REFER TO:
Case No.: 08-01-0505P
Community: City of Bristol, CT
Community No.: 090023

316-AD

Dear Mr. Bulzak:

This is in regard to your request dated February 11, 2008, that the Department of Homeland Security's Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) for the above-referenced community. Pertinent information about the request is listed below.

Identifier:	531 Broad Street
Flooding Source:	Pequabuck River
FIRM Panel(s) Affected:	0007
FBFM Panel(s) Affected:	0007 B

The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

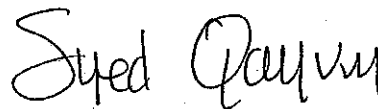
If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal.

FEMA receives a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, we are unable to grant extensions for the submission of required data/fee for revision requests. If a requester is informed by letter that additional data are required to complete our review of a request, the data/fee **must** be submitted within 90 days of the date of the letter.

If you have general questions about your request, FEMA policy, or the National Flood Insurance Program, please call the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627). If you have specific questions concerning your request, please contact your case reviewer, Ms. Angela Bard Welt, by e-mail at angela.welt@mapmodteam.com or by telephone at (717) 221-2040, or the Revisions

Coordinator for your State, Ms. Tamra Scanlon, P.E., at tamra.scanlon@mapmodteam.com or at (717) 221-2011.

Sincerely,

A handwritten signature in black ink, reading "Syed Qayum". The signature is fluid and cursive, with the first name "Syed" and last name "Qayum" clearly distinguishable.

Syed Qayum, CFM
National LOMR Technical Manager
Michael Baker Jr., Inc.

Enclosure

cc: Mr. Paul Strauderman
City Engineer
City of Bristol

Mr. Henri R. Martin
Broad Development Group of Bristol, LLC



NATIONAL FLOOD INSURANCE PROGRAM

FEMA NATIONAL SERVICE PROVIDER

Summary of Additional Data Required to Support a Letter of Map Revision (LOMR)

Case No.: 08-01-0505P

Requester: Mr. Thomas Bulzak, P.E., L.S.

Community: City of Bristol, CT

Community No.: 090023

The issues listed below must be addressed before we can continue the review of your request.

1. Please submit MT-2 Application/Certification Form 2, entitled "Riverine Hydrology & Hydraulics Form."
2. Please revise the HEC-RAS hydraulic models as follows and resubmit a digital copy.
 - a. Please recalibrate the duplicate effective HEC-RAS model to reproduce the effective Federal Emergency Management Agency (FEMA) HEC-2 Base (1-percent-annual-chance) Flood Elevations (BFEs) within 0.5 foot at all cross sections and create the corrected effective model by building on this duplicate effective model, as stipulated in Section B, Item 4 of the MT-2 Instructions.
 - b. A review of the submitted corrected effective HEC-RAS model with the CHECK-RAS program revealed many questionable Manning's "n" values, contraction and expansion loss coefficients, and encroachment stations. Please run CHECK-RAS and adjust the values in the corrected effective model or provide justification for the values used.
 - c. A review of the submitted corrected effective HEC-RAS model revealed several cross sections with BFEs higher than the end points of the cross sections. Please extend the cross sections so that the end points of all cross sections are equal to or higher than the corresponding BFEs, as stipulated in Chapter 3 of the HEC-RAS Users Manual.
 - d. The submitted corrected effective HEC-RAS model appears to cite a span of 77 feet for Bridge Number 05594, while the certified topographic work map entitled "Pequabuck River Floodplain & Floodway in Vicinity of Bridge No. 05594," prepared by EcoDesign, LLC, dated January 18, 2008, appears to cite a bridge span of 74.5 feet. Please explain or correct the inconsistency.
3. Please revise the above-referenced topographic work map as follows and resubmit a hard copy.
 - a. Please revise the boundary delineations based on the above-referenced revisions to the hydraulic model.
 - b. Please extend the scope of the topographic work map to encompass the entire area of revision in the HEC-RAS model and to show the tie-ins between the revised conditions boundary delineations and the effective boundary delineations at the upstream and downstream ends of the revised reach.
 - c. Please include the revised conditions and the effective base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway boundary delineations on the topographic work map.

4. Please revise the annotated Flood Insurance Rate Map to include the revisions to both the east and west banks of the Pequabuck River and to tie into the revised conditions boundary delineations and the effective boundary delineations at the upstream and downstream ends of the revised reach.

Please send the required data directly to Michael Baker Jr., Inc., Attention: Ms. Angela Bard Welt, at 4431 North Front Street, Second Floor, Harrisburg, PA 17110. For identification purposes, please include the case number referenced above on all correspondence.

**FEDERAL EMERGENCY MANAGEMENT AGENCY
OVERVIEW & CONCURRENCE FORM**

*O.M.B No. 3067-0148
Expires September 30, 2005*

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

- ☐ CLOMR: A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).
- ☒ LOMR: A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
090023	Bristol	CT	090023	0007	03/13/98

2. Flooding Source: Pequabuck River

3. Project Name/Identifier: 531 Broad Street, Bristol, CT

4. FEMA zone designations affected: A8 (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

- ☒ Physical Change ☒ Improved Methodology/Data
- ☐ Regulatory Floodway Revision ☐ Other (Attach Description)

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following types of flooding and structures (check all that apply)

- | | | | |
|--------------------|--|--|---|
| Types of Flooding: | <input checked="" type="checkbox"/> Riverine | <input type="checkbox"/> Coastal | <input type="checkbox"/> Shallow Flooding (e.g., Zones AO and AH) |
| | <input type="checkbox"/> Alluvial fan | <input type="checkbox"/> Lakes | <input type="checkbox"/> Other (Attach Description) |
| Structures: | <input type="checkbox"/> Channelization | <input type="checkbox"/> Levee/Floodwall | <input checked="" type="checkbox"/> Bridge/Culvert |
| | <input type="checkbox"/> Dam | <input type="checkbox"/> Fill | <input type="checkbox"/> Other, Attach Description |

C. REVIEW FEE

Has the review fee for the appropriate request category been included?

☒ Yes

Fee amount: \$4,800.00

☐ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Henri R. Martin

Company: Broad Development Group of Bristol, LLC

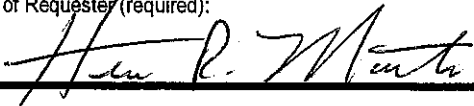
Mailing Address:
531 Broad Street
Bristol, CT
06010

Daytime Telephone No.:
860 589-0101

Fax No.:
860 582-7478

E-Mail Address:

Signature of Requester (required):



Date: January 18, 2008

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title:

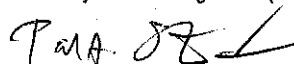
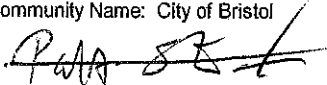
Telephone No.:

860 589 0103

Community Name: City of Bristol

Community Official's Signature (required):

Date:



2/11/08

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Thomas J. Bulzak, P.E., L.S.

License No.: CT 17942

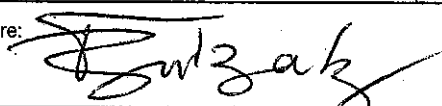
Expiration Date:
January 31, 2008

Company Name: EcoDesign, LLC

Telephone No.: 860 677-4555

Fax No.:
860 677-4555

Signature:



Date: January 18, 2008

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)

Required if ...

☒ Riverine Hydrology and Hydraulics Form (Form 2)

New or revised discharges or water-surface elevations

☒ Riverine Structures Form (Form 3)

Channel is modified, addition/revision of bridge/culverts,
addition/revision of levee/floodwall, addition/revision of dam

☐ Coastal Analysis Form (Form 4)

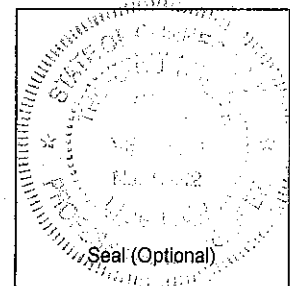
New or revised coastal elevations

☐ Coastal Structures Form (Form 5)

Addition/revision of coastal structure

☐ Alluvial Fan Flooding Form (Form 6)

Flood control measures on alluvial fans



Seal (Optional)

FEDERAL EMERGENCY MANAGEMENT AGENCY
RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Pequabuck River, Bristol, CT
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization..... complete Section B
Bridge/Culvert..... complete Section C
Dam..... complete Section D
Levee/Floodwall..... complete Section E
Sediment Transport..... complete Section F (if required)

Description Of Structure

1. Name of Structure: Bridge No. 05594

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: Broad Street over Pequabuck River

Downstream Limit/Cross Section: Cross Section 1.664, Approximately 230 feet Downstream from Bridge Face

Upstream Limit/Cross Section: Crosss Section 1.733, Approximately 60 feet Upstream from Bridge Face

2. Name of Structure: N/A

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

3. Name of Structure: N/A

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure:

Downstream Limit/Cross Section:

Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source: N/A

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- | | |
|--|--|
| <input type="checkbox"/> Levees [Attach Section E (Levee/Floodwall)] | <input type="checkbox"/> Drop structures |
| <input type="checkbox"/> Superelevated sections | <input type="checkbox"/> Transitions in cross sectional geometry |
| <input type="checkbox"/> Debris basin/detention basin | <input type="checkbox"/> Energy dissipator |
| <input type="checkbox"/> Other (Describe): | |

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

- ☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

- ☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☐ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Pequabuck River

Name of Structure: Bridge No. 05594

1. This revision reflects (check one):

- ☐ New bridge/culvert not modeled in the FIS
☒ Modified bridge/culvert previously modeled in the FIS
☒ New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS 4.0

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Dimensions (height, width, span, radius, length) | <input type="checkbox"/> Erosion Protection |
| <input type="checkbox"/> Shape (culverts only) | <input checked="" type="checkbox"/> Low Chord Elevations – Upstream and Downstream |
| <input type="checkbox"/> Material | <input checked="" type="checkbox"/> Top of Road Elevations – Upstream and Downstream |
| <input type="checkbox"/> Beveling or Rounding | <input checked="" type="checkbox"/> Structure Invert Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Wing Wall Angle | <input checked="" type="checkbox"/> Stream Invert Elevations – Upstream and Downstream |
| <input checked="" type="checkbox"/> Skew Angle | <input checked="" type="checkbox"/> Cross-Section Locations |
| <input checked="" type="checkbox"/> Distances Between Cross Sections | |

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM

Flooding Source: N/A

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam

2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency

☐ Private organization Name of the agency or organization:

3. Does the project involve revised hydrology? ☐ Yes ☐ No

If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

4. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport).

If No, then attach your explanation for why debris/sediment analysis was not considered.

5. Does the Base Flood Elevation behind the dam or downstream of the dam change?

☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)

FIS

REVISED

10-year (10%)

50-year (2%)

100-year (1%)

500-year (0.2%)

Normal Pool Elevation

6. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

- ☐ upgrading of an existing levee/floodwall system
- ☐ a newly constructed levee/floodwall system
- ☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

- ☐ earthen embankment, dike, berm, etc.
- ☐ structural floodwall
- ☐ Other (describe):

Station to
Station to
Station to

c. Structural Type (check one):

- ☐ monolithic cast-in place reinforced concrete
- ☐ reinforced concrete masonry block
- ☐ sheet piling
- ☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

- ☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

- 3.0 feet or more at the downstream end and throughout
- 3.5 feet or more at the upstream end
- 4.0 feet within 100 feet upstream of all structures and/or constrictions

- ☐ Yes ☐ No
- ☐ Yes ☐ No
- ☐ Yes ☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runoff (whichever is greater).

- ☐ Yes ☐ No

2.0 feet above the 1%-annual-chance stillwater surge elevation

- ☐ Yes ☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

- b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

- a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

- a. The maximum levee slope landside is:
- b. The maximum levee slope floodside is:
- c. The range of velocities along the levee during the base flood is: (min.) to (max.)
- d. Embankment material is protected by (describe what kind):
- e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D ₁₀₀	D ₅₀	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

- f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No
- g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

- a. Identify locations and describe the basis for selection of critical location for analysis:
- ☐ Overall height: Sta. ; height ft.
- ☐ Limiting foundation soil strength:
- Sta. , depth to
- strength ϕ = degrees, c = psf
- slope: SS = (h) to (v)
- (Repeat as needed on an added sheet for additional locations)
- b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):
- c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

- d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No
- If Yes, describe methodology used:
- e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No
- f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No
- g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No
- h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ $P_A =$ psf; $P_p =$ psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ $P_w =$ psf

☐ Seepage (Uplift); ☐ Earthquake @ $P_{eq} =$ %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement

- a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No
- b. The computed range of settlement is ft. to ft.
- c. Settlement of the levee crest is determined to be primarily from :
- ☐ Foundation consolidation
 - ☐ Embankment compression
 - ☐ Other (Describe):
- d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

- a. Specify size of each interior watershed:

Draining to pressure conduit: acres
 Draining to ponding area: acres

- b. Relationships Established

Ponding elevation vs. storage	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Ponding elevation vs. gravity flow	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Differential head vs. gravity flow	<input type="checkbox"/> Yes	<input type="checkbox"/> No

- c. The river flow duration curve is enclosed: ☐ Yes ☐ No

- d. Specify the discharge capacity of the head pressure conduit: cfs

- e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Common storm (River Watershed)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Historical ponding probability	<input type="checkbox"/> Yes	<input type="checkbox"/> No
• Coastal wave overtopping	<input type="checkbox"/> Yes	<input type="checkbox"/> No

If No for any of the above, attach explanation.

- f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

- g. The rate of seepage through the levee system for the base flood is cfs

- h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem

Hydrocompaction ☐ is ☐ is not a problem

Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure? ☐
Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
- b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations? ☐ Yes ☐ No
- c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations? ☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

- a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source: N/A

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

**531 & 535 BROOD STREET
BRISTOL, CONNECTICUT**

**PEQUABUCK RIVER HYDRAULICS
STUDY REPORT**

**VICINITY OF BRIDGE No. 05594
BROAD STREET (CT STATE ROUTE 72)
OVER
PEQUABUCK RIVER
BRISTOL, CONNECTICUT**

JANUARY 2008

Prepared For:

**BROAD DEVELOPMENT GROUP OF BRISTOL, LLC
HENRI R. MARTIN**

Prepared By:

EcoDesign, LLC

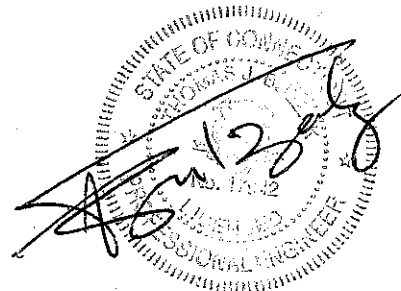


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HYDRAULIC DESIGN REPORT

I. STUDY BACKGROUND

A. STUDY PURPOSE

Broad Development Group of Bristol, LLC retained services of EcoDesign, LLC to analyze flooding levels and extents at their property located at 531 and 535 Broad Street, Bristol, CT. The property is located upstream of Bridge No. 05594 on the east bank of the Pequabuck River.

The goal of this study is to demonstrate that the base flood elevations of the Pequabuck River do not inundate structures located on the property, and request from FEMA a statement to this effect.

B. RECONSTRUCTED BRIDGE NO. 05594

Flood levels on the subject property are directly related to the hydraulic performance of Bridge No. 05594 and backwater created by this structure.

Review of the available records reveals that the subject crossing (Bridge No. 05594) has been reconstructed by the State of Connecticut Department of Transportation in August 1988.

The reconstruction of the bridge was completed approximately seven years after the effective date of the City of Bristol FIRM and Flood Insurance Study (November 1981 and may 1981 respectively)

Comparisons of the effective model of the studied river reach (March 1998) with the record as-built plans of the bridge and the current survey indicates several inconsistencies:

Effective Bridge Model

Total Span = 74.5'

Bridge Length = 40'

Low Chord Elevations = 236.9 - 234.1

Top of road Elevation = 238.5

Corrected Bridge Model

Total Span = 76.95'

Bridge Length = 57.64'

Low Chord Elevations = 234.4 - 234.1

Top of road Elevation = 237.3

II. HYDROLOGIC DATA

A. FEMA/FIS PEAK FLOW RATES

The City of Bristol FEMA/FIS discharges were utilized in this study. The May 18, 1981 Flood Insurance Study discharges were verified based on the original data obtained from the FEMA Project Coordinator in July 2007. Following are the project discharges:

Table 1	
FREQUENCY	DISCHARGE
10 – year [cfs]	2372
50 – year [cfs]	4431
100 – year [cfs]	5594
500 – year [cfs]	9110

III. HYDRAULIC MODELS

A. EFFECTIVE BASE MODEL

The original HEC-2 data obtained from FEMA were imported to HEC-RAS version 4.0. Minor modifications were required to allow for the analysis by HEC-RAS. The modifications were instituted only to satisfy the bridge model input data requirements.

The performed analysis resulted in very close agreement with the published effective model dated march 1998.

B. CORRECTED BASE MODEL

The corrected model was created by substituting the pertinent effective bridge model data with record as-built and current survey data in the immediate vicinity of Bridge No. 05594. The rest of the effective model outside of the area of interest was retained.

The performed analysis of the corrected model resulted in base flood elevations, in the area upstream of the bridge, approximately 1 foot lower as compared to the effective model.

More importantly, the resulting lower base flood elevations are confined within the channel bank (approximate minimum 0.6 foot freeboard) along the entire westerly property line of 531 & 535 Broad Street.

The base flood confinement within the easterly bank of the Pequabuck River effectively prevents the inundation of the structures located on the subject property.

C. FLOODWAY ANALYSIS

As expected, in the area upstream of the bridge, the corrected floodway model elevations are also approximately 1 foot lower then the effective floodway model.

In this study the corrected floodway model maintains the effective floodway extents and widths.

A CD, containing the hydraulic analyses prepared for this report, is enclosed with this document.

531 & 535 Broad Street
Pequabuck River Hydraulics Study
Vicinity of Bridge No. 05594
Bristol, Connecticut
January 2008

TECHNICAL APPENDICES

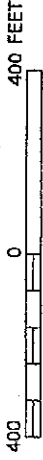
531 & 535 Broad Street
Pequabuck River Hydraulics Study
Vicinity of Bridge No. 05594
Bristol, Connecticut
January 2008

APPENDIX A – EFFECTIVE AND ANNOTATED FIRM & FLOODWAY MAPS

MAP LEGEND



APPROXIMATE SCALE



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
BRISTOL,
CONNECTICUT
HARTFORD COUNTY

PANEL 7 OF 10

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY - PANEL NUMBER
090023 0007 B

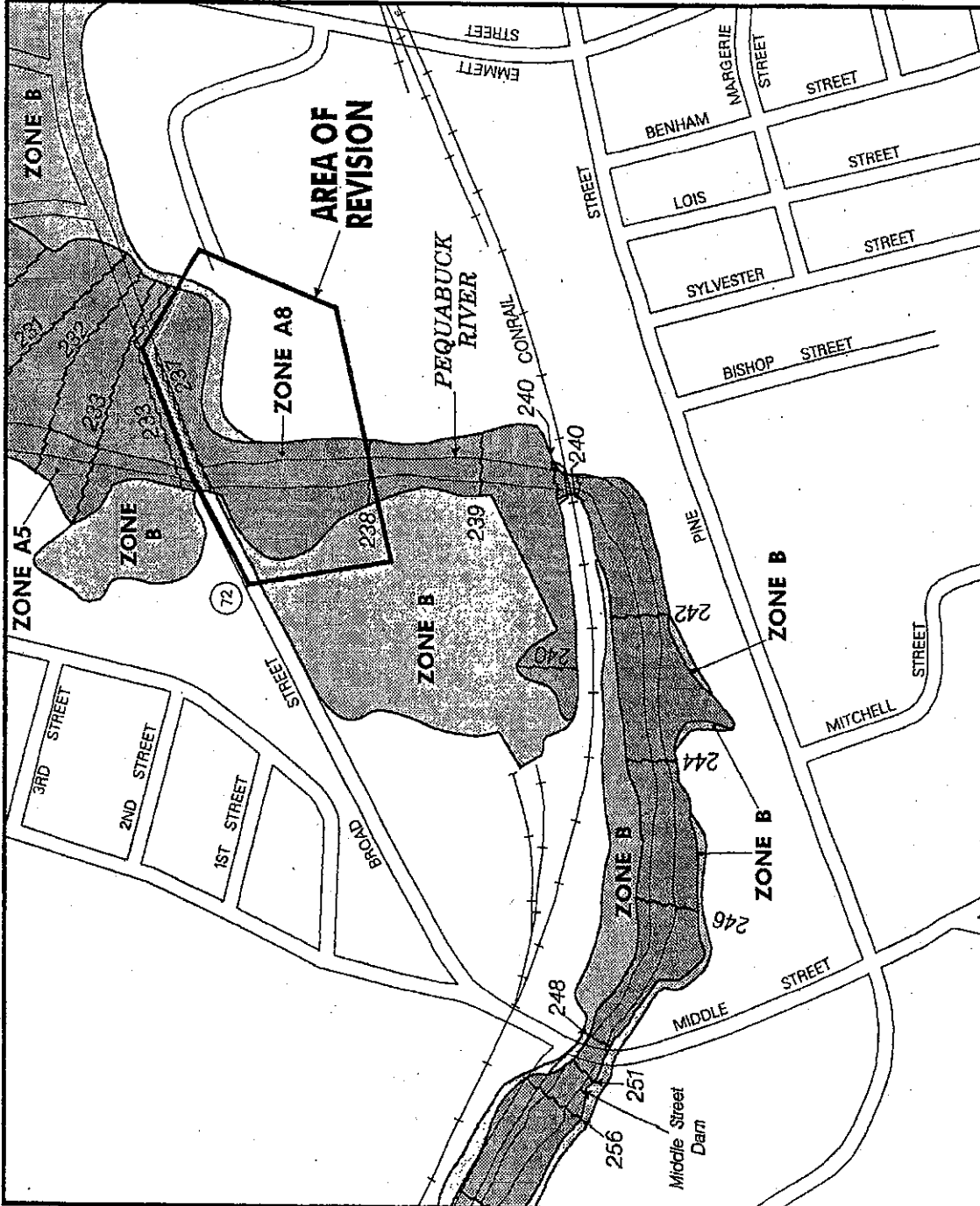
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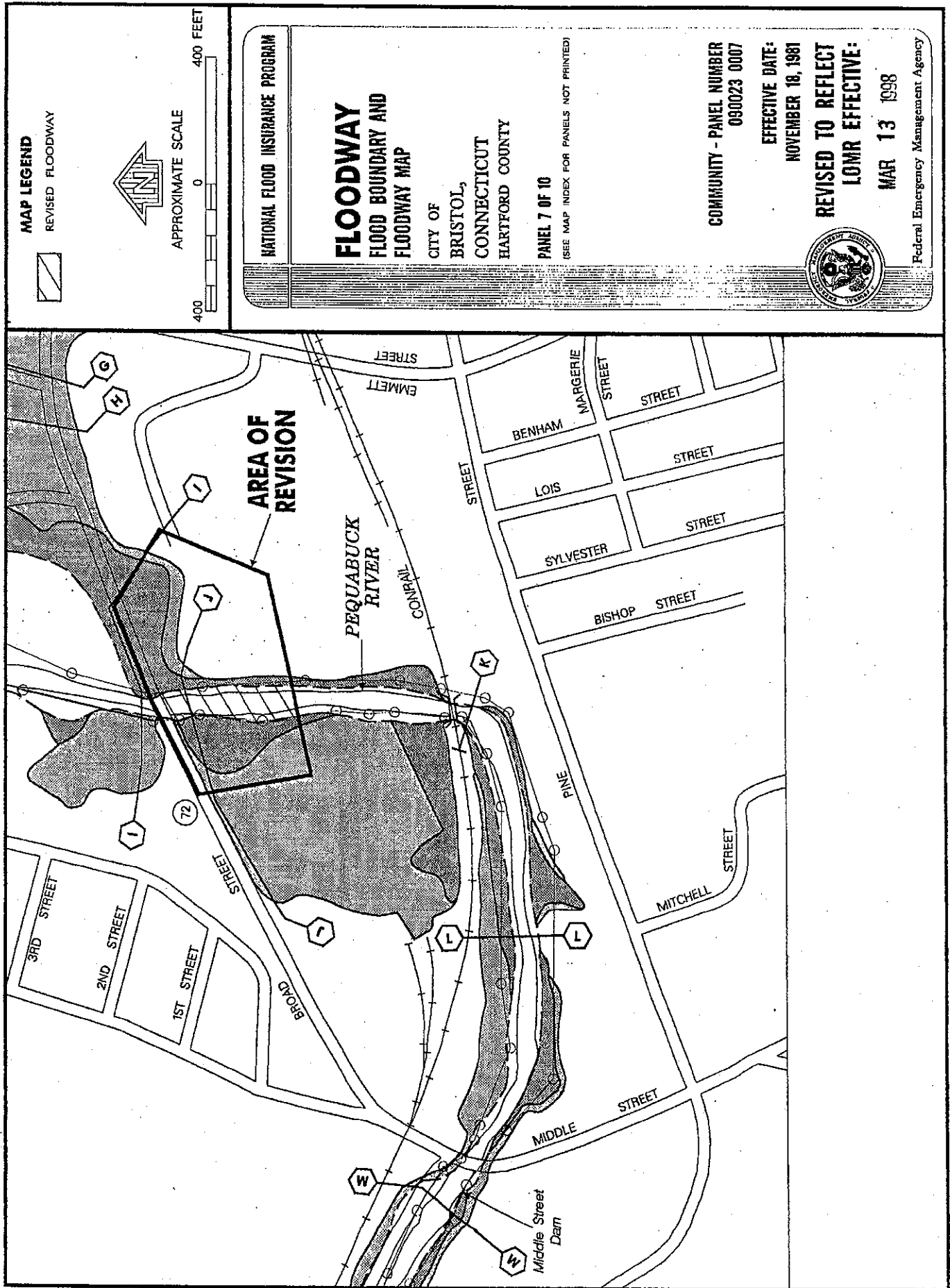
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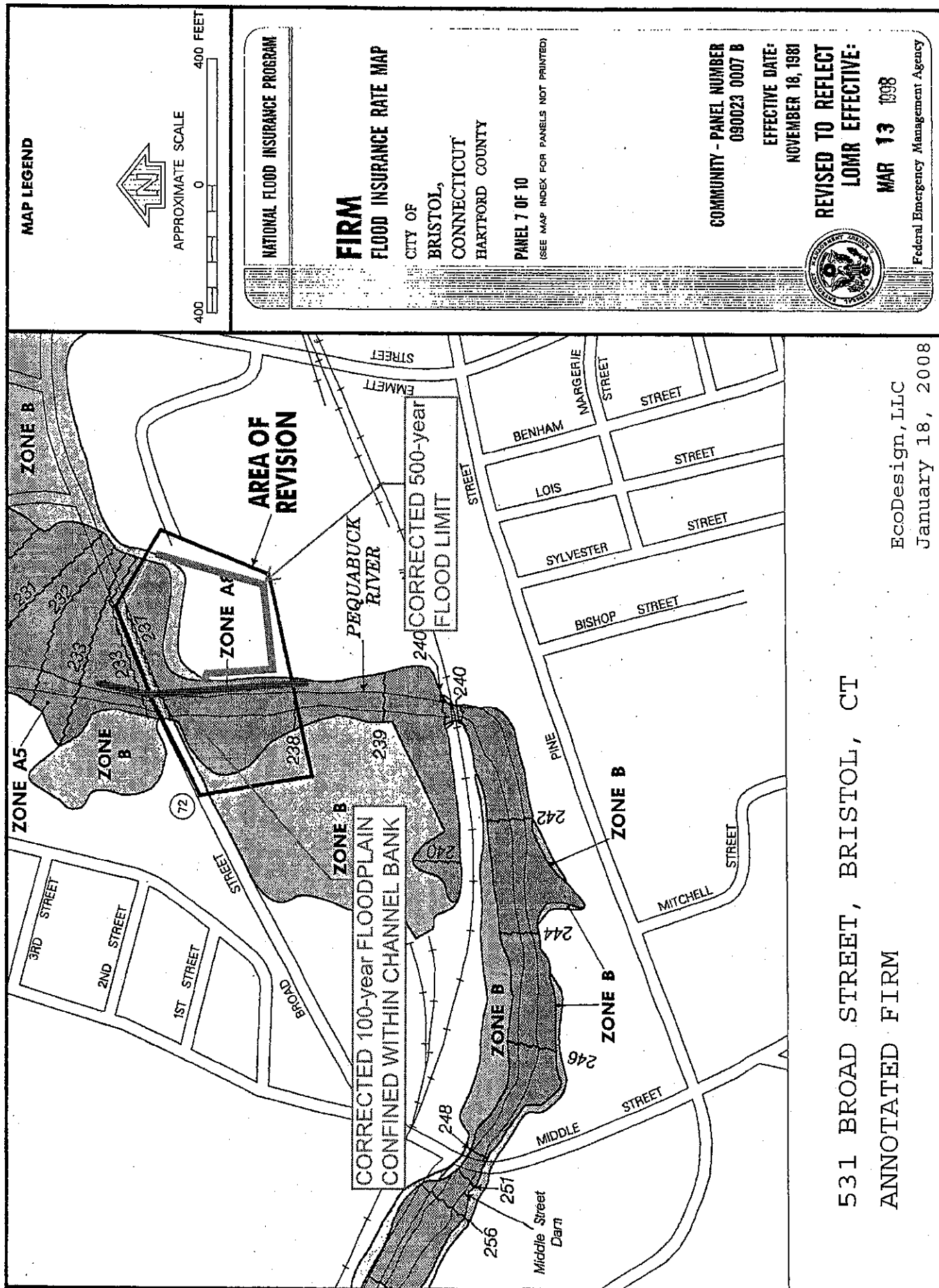
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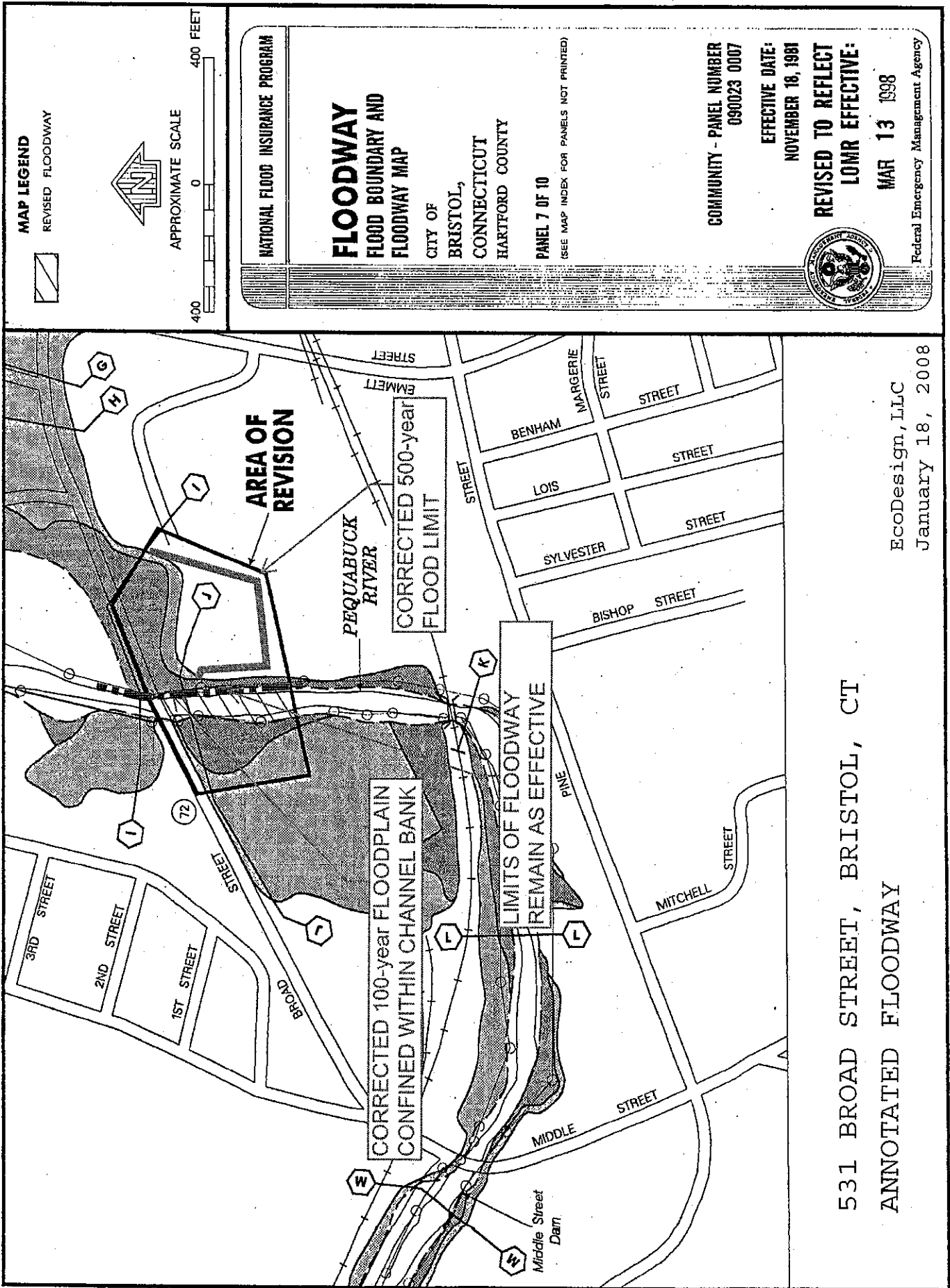


Federal Emergency Management Agency









APPENDIX B – FLOODPLAIN HYDRAULIC MODELS

Reach	River Sta	Profile	Plan	O. Total (cfs)	Min. Ch. El. (ft)	W.S. Elev (ft)	Crit. W. S. (ft)	E.C. Elev (ft)	E.G. Slope (ft/ft)	Vel. Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Friction # Chl
@ Br. No. 05594	1.873	10 year	FEMA CORRECT	2372.00	229.60	235.32		236.31	0.005022	8.23	341.41	140.62	0.62
@ Br. No. 05594	1.873	10 year	FEMA EFFECTIVE	2372.00	229.60	235.33		236.31	0.005017		341.62	140.93	0.62
@ Br. No. 05594	1.82	10 year	FEMA CORRECT	2372.00	227.00	234.61		235.28	0.002389	6.75	390.65	65.97	0.44
@ Br. No. 05594	1.82	10 year	FEMA EFFECTIVE	2372.00	227.00	234.62		235.28	0.002387	6.75	390.80	65.98	0.44
@ Br. No. 05594	1.761	10 year	FEMA CORRECT	2372.00	228.00	233.25		234.15	0.005922	7.62	317.02	81.69	0.64
@ Br. No. 05594	1.761	10 year	FEMA EFFECTIVE	2372.00	228.00	233.27		234.16	0.005864	7.60	318.07	81.81	0.64
@ Br. No. 05594	1.751	10 year	FEMA CORRECT	2372.00	227.00	233.10		233.87	0.004032	7.08	337.93	83.57	0.60
@ Br. No. 05594	1.751	10 year	FEMA EFFECTIVE	2372.00	227.00	233.11		233.88	0.003983	7.05	339.26	83.67	0.60
@ Br. No. 05594	1.742	10 year	FEMA CORRECT	2372.00	227.00	232.58		233.59	0.007119	8.05	297.16	74.62	0.69
@ Br. No. 05594	1.742	10 year	FEMA EFFECTIVE	2372.00	227.00	232.61		233.60	0.006949	8.00	298.41	74.75	0.69
@ Br. No. 05594	1.733	10 year	FEMA CORRECT	2372.00	226.80	232.46		233.17	0.004013	7.04	372.75	84.94	0.55
@ Br. No. 05594	1.733	10 year	FEMA EFFECTIVE	2372.00	226.80	232.48		233.20	0.003921	6.99	375.67	85.09	0.54
@ Br. No. 05594	1.720	10 year	FEMA CORRECT	2372.00	226.00	232.41	230.35	232.97	0.001341	5.98	396.79	76.96	0.46
@ Br. No. 05594	1.719	10 year	FEMA EFFECTIVE	2372.00	225.50	232.59	229.08	232.94	0.000512	4.75	499.21	80.07	0.32
@ Br. No. 05594	1.715			Bridge									
@ Br. No. 05594	1.711	10 year	FEMA EFFECTIVE	2372.00	225.50	232.56	229.08	232.92	0.000519	4.77	497.26	80.05	0.33
@ Br. No. 05594	1.710	10 year	FEMA CORRECT	2372.00	226.20	232.15	230.54	232.82	0.001846	6.55	362.08	76.96	0.53
@ Br. No. 05594	1.704	10 year	FEMA EFFECTIVE	2372.00	224.70	231.65		232.69	0.005039	8.50	316.90	61.11	0.62
@ Br. No. 05594	1.702	10 year	FEMA CORRECT	2372.00	223.60	231.52		232.56	0.005482	8.25	295.89	61.12	0.62
@ Br. No. 05594	1.664	10 year	FEMA CORRECT	2372.00	223.20	230.13	229.11	231.46	0.006448	9.50	345.16	493.42	0.69
@ Br. No. 05594	1.664	10 year	FEMA EFFECTIVE	2372.00	223.20	230.13	229.11	231.46	0.006448	9.50	345.16	493.42	0.69
@ Br. No. 05594	1.607	10 year	FEMA CORRECT	2372.00	222.70	228.28		229.37	0.006920	8.80	324.41	92.92	0.71
@ Br. No. 05594	1.607	10 year	FEMA EFFECTIVE	2372.00	222.70	228.28		229.37	0.006920	8.80	324.41	92.92	0.71
@ Br. No. 05594	1.599	10 year	FEMA CORRECT	2372.00	220.20	225.89	225.57	226.69	0.007641	7.31	373.40	223.82	0.76
@ Br. No. 05594	1.599	10 year	FEMA EFFECTIVE	2372.00	220.20	225.89	225.57	226.69	0.007641	7.31	373.40	223.82	0.76
@ Br. No. 05594	1.432	10 year	FEMA CORRECT	2372.00	218.00	223.08	221.83	223.75	0.003674	6.92	393.14	103.78	0.58
@ Br. No. 05594	1.432	10 year	FEMA EFFECTIVE	2372.00	218.00	223.08	221.83	223.75	0.003674	6.92	393.14	103.78	0.58

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Chl El (ft)	W/S Elev (ft)	Crit W/S (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Friction # Chl
@ Br. No. 05594	1.873	50 year	FEMA CORRECT	4431.00	229.60	238.52		238.81	0.001165	5.37	1289.63	333.38	0.32
@ Br. No. 05594	1.873	50 year	FEMA EFFECTIVE	4431.00	229.60	238.60		238.87	0.001106	5.26	1294.59	334.73	0.31
@ Br. No. 05594	1.82	50 year	FEMA CORRECT	4431.00	227.00	237.05		238.23	0.002970	9.12	570.77	80.00	0.52
@ Br. No. 05594	1.82	50 year	FEMA EFFECTIVE	4431.00	227.00	237.17		238.31	0.002833	8.98	580.88	80.56	0.50
@ Br. No. 05594	1.761	50 year	FEMA CORRECT	4431.00	228.00	236.16		237.17	0.003539	8.25	601.24	170.82	0.54
@ Br. No. 05594	1.761	50 year	FEMA EFFECTIVE	4431.00	228.00	236.41		237.33	0.003091	7.88	646.01	181.86	0.50
@ Br. No. 05594	1.751	50 year	FEMA CORRECT	4431.00	227.00	236.12		236.99	0.002284	7.58	625.72	118.18	0.49
@ Br. No. 05594	1.751	50 year	FEMA EFFECTIVE	4431.00	227.00	236.37		237.17	0.002020	7.29	656.88	129.18	0.47
@ Br. No. 05594	1.742	50 year	FEMA CORRECT	4431.00	227.00	235.78		236.83	0.003588	8.32	559.60	91.34	0.54
@ Br. No. 05594	1.742	50 year	FEMA EFFECTIVE	4431.00	227.00	236.07		237.03	0.003123	7.99	586.22	96.87	0.51
@ Br. No. 05594	1.733	50 year	FEMA CORRECT	4431.00	226.80	235.74		236.56	0.002505	7.71	678.08	106.14	0.47
@ Br. No. 05594	1.733	50 year	FEMA EFFECTIVE	4431.00	226.80	236.03		236.80	0.002228	7.44	709.64	109.93	0.44
@ Br. No. 05594	1.720	50 year	FEMA CORRECT	4431.00	226.00	235.70	231.94	236.43	0.000896	6.82	649.87	121.41	0.41
@ Br. No. 05594	1.719	50 year	FEMA EFFECTIVE	4431.00	225.50	236.09	230.70	236.61	0.000437	5.82	761.63	186.36	0.32
@ Br. No. 05594	1.715			Bridge									
@ Br. No. 05594	1.711	50 year	FEMA EFFECTIVE	4431.00	225.50	235.26	230.70	235.89	0.000580	6.33	699.78	105.20	0.37
@ Br. No. 05594	1.710	50 year	FEMA CORRECT	4431.00	226.20	234.82	232.13	235.77	0.001558	7.81	567.53	76.96	0.51
@ Br. No. 05594	1.704	50 year	FEMA EFFECTIVE	4431.00	224.70	232.22	232.22	235.16	0.012731	14.37	351.56	61.13	1.00
@ Br. No. 05594	1.702	50 year	FEMA CORRECT	4431.00	223.60	232.22	232.22	235.05	0.012661	13.59	341.49	68.46	0.96
@ Br. No. 05594	1.664	50 year	FEMA CORRECT	4431.00	223.20	232.59		232.88	0.001659	6.08	1758.99	653.65	0.37
@ Br. No. 05594	1.664	50 year	FEMA EFFECTIVE	4431.00	223.20	232.59		232.88	0.001659	6.08	1758.99	653.65	0.37
@ Br. No. 05594	1.607	50 year	FEMA CORRECT	4431.00	222.70	229.36	229.36	231.64	0.011408	12.93	431.24	104.92	0.94
@ Br. No. 05594	1.607	50 year	FEMA EFFECTIVE	4431.00	222.70	229.36	229.36	231.64	0.011408	12.93	431.24	104.92	0.94
@ Br. No. 05594	1.539	50 year	FEMA CORRECT	4431.00	220.20	227.72		228.31	0.003481	6.86	965.15	424.32	0.56
@ Br. No. 05594	1.539	50 year	FEMA EFFECTIVE	4431.00	220.20	227.72		228.31	0.003481	6.86	965.15	424.32	0.56
@ Br. No. 05594	1.432	50 year	FEMA CORRECT	4431.00	218.00	225.58	223.32	226.51	0.002832	8.19	690.27	193.97	0.55
@ Br. No. 05594	1.432	50 year	FEMA EFFECTIVE	4431.00	218.00	225.58	223.32	226.51	0.002832	8.19	690.27	193.97	0.55

HEC-RAS River: Pequabuck River Reach: @ Br. No. 05594 Profile: 100 year

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Eroude # Chl
@ Br. No. 05594	1.873	100 year	FEMA CORRECT	5594.00	229.60	239.84		240.07	0.000806	4.91	1725.00	357.12	0.27
@ Br. No. 05594	1.873	100 year	FEMA EFFECTIVE	5594.00	229.60	240.17		240.37	0.000669	4.57	1843.85	361.54	0.25
@ Br. No. 05594	1.82	100 year	FEMA CORRECT	5594.00	227.00	238.09		239.54	0.003253	10.21	656.42	84.58	0.55
@ Br. No. 05594	1.82	100 year	FEMA EFFECTIVE	5594.00	227.00	238.64		239.93	0.002698	9.62	704.18	87.03	0.50
@ Br. No. 05594	1.761	100 year	FEMA CORRECT	5594.00	228.00	237.54		238.46	0.002730	8.13	879.31	231.02	0.49
@ Br. No. 05594	1.761	100 year	FEMA EFFECTIVE	5594.00	228.00	238.47		239.08	0.001670	6.80	1167.22	395.28	0.39
@ Br. No. 05594	1.751	100 year	FEMA CORRECT	5594.00	227.00	237.46		238.34	0.001928	7.78	840.05	252.12	0.46
@ Br. No. 05594	1.751	100 year	FEMA EFFECTIVE	5594.00	227.00	238.42		239.00	0.001174	6.51	1168.58	395.85	0.37
@ Br. No. 05594	1.742	100 year	FEMA CORRECT	5594.00	227.00	237.06		238.19	0.003183	8.74	717.74	256.35	0.52
@ Br. No. 05594	1.742	100 year	FEMA EFFECTIVE	5594.00	227.00	238.29		238.92	0.001644	6.87	1126.47	394.11	0.38
@ Br. No. 05594	1.733	100 year	FEMA CORRECT	5594.00	226.80	236.94		238.01	0.002755	8.84	819.51	163.02	0.50
@ Br. No. 05594	1.733	100 year	FEMA EFFECTIVE	5594.00	226.80	237.97		238.78	0.001866	7.78	1089.86	367.30	0.42
@ Br. No. 05594	1.720	100 year	FEMA CORRECT	5594.00	226.00	236.94	232.74	237.82	0.001040	7.50	745.38	234.55	0.42
@ Br. No. 05594	1.719	100 year	FEMA EFFECTIVE	5594.00	225.50	238.12	231.50	238.54	0.000303	5.47	1661.05	971.74	0.28
@ Br. No. 05594	1.715		Bridge										
@ Br. No. 05594	1.711	100 year	FEMA EFFECTIVE	5594.00	225.50	236.74	231.50	237.48	0.000567	6.90	810.15	306.04	0.37
@ Br. No. 05594	1.710	100 year	FEMA CORRECT	5594.00	226.20	236.11	232.93	237.20	0.001505	8.39	666.71	151.67	0.50
@ Br. No. 05594	1.704	100 year	FEMA EFFECTIVE	5594.00	224.70	233.22	233.22	236.64	0.012305	15.56	412.52	61.17	1.01
@ Br. No. 05594	1.702	100 year	FEMA CORRECT	5594.00	223.60	233.24	233.24	236.42	0.011822	14.52	416.24	78.09	0.95
@ Br. No. 05594	1.664	100 year	FEMA CORRECT	5594.00	223.20	233.65		233.85	0.001113	5.39	2487.18	722.44	0.31
@ Br. No. 05594	1.664	100 year	FEMA EFFECTIVE	5594.00	223.20	233.66		233.85	0.001113	5.39	2487.18	722.44	0.31
@ Br. No. 05594	1.607	100 year	FEMA CORRECT	5594.00	222.70	229.94	229.94	232.79	0.012829	14.58	493.15	111.29	1.01
@ Br. No. 05594	1.607	100 year	FEMA EFFECTIVE	5594.00	222.70	229.94	229.94	232.79	0.012829	14.58	493.15	111.29	1.01
@ Br. No. 05594	1.539	100 year	FEMA CORRECT	5594.00	220.20	228.57		229.07	0.002595	6.62	1366.55	517.87	0.50
@ Br. No. 05594	1.539	100 year	FEMA EFFECTIVE	5594.00	220.20	228.57		229.07	0.002595	6.62	1366.55	517.87	0.50
@ Br. No. 05594	1.432	100 year	FEMA CORRECT	5594.00	218.00	226.55	224.04	227.55	0.002662	8.67	944.10	329.38	0.54
@ Br. No. 05594	1.432	100 year	FEMA EFFECTIVE	5594.00	218.00	226.55	224.04	227.55	0.002662	8.67	944.10	329.38	0.54

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/m)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # CH
@ Br. No. 05594	1.873	500 year	FEMA CORRECT	9110.00	229.60	242.75		242.96	0.000530	4.72	2807.15	384.77	0.23
@ Br. No. 05594	1.873	500 year	FEMA EFFECTIVE	9110.00	229.60	242.75		242.95	0.000532	4.72	2804.50	384.71	0.23
@ Br. No. 05594	1.82	500 year	FEMA CORRECT	9110.00	227.00	239.61		242.36	0.005275	14.20	789.94	91.26	0.71
@ Br. No. 05594	1.82	500 year	FEMA EFFECTIVE	9110.00	227.00	239.58		242.36	0.005310	14.23	787.98	91.17	0.72
@ Br. No. 05594	1.761	500 year	FEMA CORRECT	9110.00	228.00	240.31		240.91	0.001592	7.46	2071.13	566.37	0.39
@ Br. No. 05594	1.761	500 year	FEMA EFFECTIVE	9110.00	228.00	240.28		240.89	0.001620	7.51	2053.51	565.56	0.39
@ Br. No. 05594	1.751	500 year	FEMA CORRECT	9110.00	227.00	240.23		240.84	0.001166	7.28	1999.88	513.52	0.38
@ Br. No. 05594	1.751	500 year	FEMA EFFECTIVE	9110.00	227.00	240.20		240.82	0.001187	7.33	1983.22	512.73	0.38
@ Br. No. 05594	1.742	500 year	FEMA CORRECT	9110.00	227.00	240.18		240.76	0.001463	7.28	1999.25	522.84	0.37
@ Br. No. 05594	1.742	500 year	FEMA EFFECTIVE	9110.00	227.00	240.15	238.12	240.74	0.001490	7.33	1982.61	521.97	0.38
@ Br. No. 05594	1.733	500 year	FEMA CORRECT	9110.00	226.80	239.98		240.65	0.001584	8.04	2318.69	859.16	0.40
@ Br. No. 05594	1.733	500 year	FEMA EFFECTIVE	9110.00	226.80	237.83		240.10	0.005282	12.98	1040.75	332.87	0.70
@ Br. No. 05594	1.720	500 year	FEMA CORRECT	9110.00	226.00	239.92	234.84	240.59	0.000700	7.29	1767.31	308.30	0.36
@ Br. No. 05594	1.719	500 year	FEMA EFFECTIVE	9110.00	225.50	238.38	233.65	239.34	0.000699	8.43	1915.53	1017.16	0.42
@ Br. No. 05594	1.715			Bridge									
@ Br. No. 05594	1.711	500 year	FEMA EFFECTIVE	9110.00	225.50	236.26	233.65	238.41	0.001749	11.77	774.24	217.45	0.65
@ Br. No. 05594	1.710	500 year	FEMA CORRECT	9110.00	226.20	239.40	235.03	240.22	0.000922	7.98	1593.61	308.30	0.41
@ Br. No. 05594	1.704	500 year	FEMA EFFECTIVE	9110.00	224.70	236.68	236.68	237.87	0.003878	11.28	1958.47	706.73	0.60
@ Br. No. 05594	1.702	500 year	FEMA CORRECT	9110.00	223.60	236.75	236.75	239.54	0.006717	14.26	843.52	172.70	0.77
@ Br. No. 05594	1.664	500 year	FEMA CORRECT	9110.00	223.20	233.99		234.40	0.002311	7.96	2734.57	744.37	0.45
@ Br. No. 05594	1.664	500 year	FEMA EFFECTIVE	9110.00	223.20	233.99		234.40	0.002311	7.96	2734.57	744.37	0.45
@ Br. No. 05594	1.607	500 year	FEMA CORRECT	9110.00	222.70	232.09	232.09	233.30	0.005504	11.56	1779.13	620.41	0.69
@ Br. No. 05594	1.607	500 year	FEMA EFFECTIVE	9110.00	222.70	232.09	232.09	233.30	0.005504	11.56	1779.13	620.41	0.69
@ Br. No. 05594	1.539	500 year	FEMA CORRECT	9110.00	220.20	230.29		230.73	0.001858	6.71	2414.17	679.01	0.44
@ Br. No. 05594	1.539	500 year	FEMA EFFECTIVE	9110.00	220.20	230.29		230.73	0.001858	6.71	2414.17	679.01	0.44
@ Br. No. 05594	1.432	500 year	FEMA CORRECT	9110.00	218.00	228.75	227.10	229.61	0.002014	8.88	2006.56	636.50	0.49
@ Br. No. 05594	1.432	500 year	FEMA EFFECTIVE	9110.00	218.00	228.75	227.10	229.61	0.002014	8.88	2006.56	636.50	0.49

APPENDIX C – FLOODWAY HYDRAULIC MODELS

HEC-RAS Plan: Floodway EFFECT River: Pequeabuck River Reach: @ Br. No. 05594

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Len (ft)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
@ Br. No. 05594	1.873	100 year	240.17		240.37	361.54	2882.98	2321.76	389.26		976.00	1025.00	
@ Br. No. 05594	1.873	100 year Floodwa	240.31	0.14	240.53	275.00	2916.03	2425.29	252.69	775.00	976.00	1025.00	1050.00
@ Br. No. 05594	1.82	100 year	238.64		239.93	87.03	222.33	4898.55	473.12		975.00	1020.00	
@ Br. No. 05594	1.82	100 year Floodwa	238.88	0.23	240.10	76.00	226.93	4874.81	492.45	964.00	975.00	1020.00	1040.00
@ Br. No. 05594	1.761	100 year	238.47		239.08	399.28	649.70	4593.19	351.11		1050.00	1120.00	
@ Br. No. 05594	1.761	100 year Floodwa	238.44	-0.03	239.27	100.00	140.29	5105.93	347.78	1040.00	1050.00	1120.00	1140.00
@ Br. No. 05594	1.753	100 year	238.42		239.00	395.85	576.43	4848.27	169.30		1063.00	1140.00	
@ Br. No. 05594	1.751	100 year Floodwa	238.44	0.02	239.15	109.17	241.06	5213.36	139.58	1040.00	1063.00	1140.00	1150.00
@ Br. No. 05594	1.742	100 year	238.29		238.92	394.11	710.65	4758.33	125.02		1118.00	1188.00	
@ Br. No. 05594	1.742	100 year Floodwa	238.20	-0.10	239.06	97.09	227.97	5242.16	123.87	1100.00	1118.00	1188.00	1198.00
@ Br. No. 05594	1.733	100 year	237.97		238.78	367.30	832.14	4742.53	19.34		1970.00	2027.00	
@ Br. No. 05594	1.733	100 year Floodwa	237.86	-0.11	238.90	83.65	495.32	5074.58	24.10	1960.00	1970.00	2027.00	2050.00
@ Br. No. 05594	1.719	100 year	238.12		238.54	971.74	530.73	5002.95	60.32		962.50	1037.50	
@ Br. No. 05594	1.719	100 year Floodwa	238.12	0.00	238.54	971.74	530.73	5002.95	60.32		962.50	1037.50	
@ Br. No. 05594	1.715 BR U	100 year	238.12		238.54	462.32	1.61	5111.39	480.98		962.50	1037.50	
@ Br. No. 05594	1.715 BR U	100 year Floodwa	238.12	0.00	238.54	462.32	1.61	5111.39	480.98		962.50	1037.50	
@ Br. No. 05594	1.715 BR D	100 year	238.12		238.48	462.32	1.61	5111.39	480.98		962.50	1037.50	
@ Br. No. 05594	1.715 BR D	100 year Floodwa	238.12	0.00	238.48	462.32	1.61	5111.39	480.98		962.50	1037.50	
@ Br. No. 05594	1.711	100 year	236.74		237.48	75.00		5594.00			962.50	1037.50	
@ Br. No. 05594	1.711	100 year Floodwa	236.74	0.00	237.48	75.00		5594.00			962.50	1037.50	
@ Br. No. 05594	1.704	100 year	233.22		236.64	61.17	619.60	4958.49	15.91		981.00	1024.00	
@ Br. No. 05594	1.704	100 year Floodwa	233.22	0.00	236.64	61.17	619.60	4958.49	15.91		981.00	1024.00	
@ Br. No. 05594	1.664	100 year	233.65		233.85	722.44	675.35	2033.38	2885.27		980.00	1020.00	
@ Br. No. 05594	1.664	100 year Floodwa	233.72	0.07	234.01	450.00	665.79	2336.16	2592.05	900.00	980.00	1020.00	1350.00
@ Br. No. 05594	1.607	100 year	229.94		232.79	111.29	263.17	4724.25	606.58		975.00	1025.00	
@ Br. No. 05594	1.607	100 year Floodwa	229.94	0.00	232.79	111.29	263.17	4724.25	606.58	956.00	975.00	1025.00	1200.00
@ Br. No. 05594	1.539	100 year	228.57		229.07	517.87	181.21	3961.91	1450.87		956.00	1064.00	
@ Br. No. 05594	1.539	100 year Floodwa	228.77	0.20	229.27	300.00	65.95	4031.84	1496.21	950.00	956.00	1064.00	1250.00
@ Br. No. 05594	1.432	100 year	226.55		227.55	329.38	475.43	4648.79	469.78		957.00	1025.00	
@ Br. No. 05594	1.432	100 year Floodwa	226.74	0.19	227.80	150.00	177.26	4639.72	577.02	950.00	957.00	1025.00	1100.00

HEC-RAS Plan: Floodway CORRECT River: Pequabuck River Reach: @ Br. No. 05594

Reach	River Sta	Profile	W/S Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Len (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
@ Br. No. 05594	1.873	100 year	239.84		240.07	357.12	2818.68	2414.12	361.20		976.00	1025.00	
@ Br. No. 05594	1.873	100 year Floodwa	240.04	0.20	240.28	275.00	2855.08	2489.06	249.86	775.00	976.00	1025.00	1050.00
@ Br. No. 05594	1.82	100 year	238.09		239.54	84.58	209.38	4945.65	438.97		975.00	1020.00	
@ Br. No. 05594	1.82	100 year Floodwa	238.46	0.37	239.79	76.00	217.66	4902.06	474.28	964.00	975.00	1020.00	1040.00
@ Br. No. 05594	1.761	100 year	237.54		238.46	231.02	330.80	4956.93	306.27		1050.00	1120.00	
@ Br. No. 05594	1.761	100 year Floodwa	237.87	0.33	238.83	100.00	128.95	5143.44	321.61	1040.00	1050.00	1120.00	1140.00
@ Br. No. 05594	1.751	100 year	237.46		238.34	252.12	240.66	5215.08	138.25		1063.00	1140.00	
@ Br. No. 05594	1.751	100 year Floodwa	237.86	0.40	238.69	109.13	205.31	5258.29	130.41	1040.00	1063.00	1140.00	1150.00
@ Br. No. 05594	1.742	100 year	237.06		238.19	258.35	199.09	5304.73	90.18		1118.00	1188.00	
@ Br. No. 05594	1.742	100 year Floodwa	237.56	0.50	238.57	97.04	191.54	5292.60	109.86	1100.00	1118.00	1188.00	1198.00
@ Br. No. 05594	1.733	100 year	236.94		238.01	163.02	708.13	4862.00	23.87		1970.00	2027.00	
@ Br. No. 05594	1.733	100 year Floodwa	237.21	0.27	238.38	79.27	500.75	5067.64	25.61	1960.00	1970.00	2027.00	2050.00
@ Br. No. 05594	1.720	100 year	236.94		237.82	76.96		5594.00			961.52	1038.48	
@ Br. No. 05594	1.720	100 year Floodwa	237.30	0.36	238.11	76.96		5594.00			961.52	1038.48	
@ Br. No. 05594	1.715	100 year	236.94		237.82		210.86	4567.78	814.33		961.52	1038.48	
@ Br. No. 05594	1.715	100 year Floodwa	237.30	0.36	238.11		329.28	4258.06	1009.06		961.52	1038.48	
@ Br. No. 05594	1.715	100 year	236.94		237.75		210.86	4567.78	814.33		961.52	1038.48	
@ Br. No. 05594	1.715	100 year Floodwa	237.30	0.36	238.05	188.53	329.28	4258.06	1009.06		961.52	1038.48	
@ Br. No. 05594	1.710	100 year	236.11		237.20	76.96		5594.00			961.52	1038.48	
@ Br. No. 05594	1.710	100 year Floodwa	236.63	0.52	237.61	76.96		5594.00			961.52	1038.48	
@ Br. No. 05594	1.702	100 year	233.24		236.42	78.09	86.56	5428.81	80.63		971.50	1023.20	
@ Br. No. 05594	1.702	100 year Floodwa	233.14	-0.10	236.69	53.00	3.78	5582.69	7.53	971.00	971.50	1023.20	1024.00
@ Br. No. 05594	1.664	100 year	233.65		233.85	722.44	675.35	2033.38	2885.27		980.00	1020.00	
@ Br. No. 05594	1.664	100 year Floodwa	233.72	0.07	234.01	450.00	665.79	2336.16	2592.05	900.00	980.00	1020.00	1350.00
@ Br. No. 05594	1.607	100 year	229.94		232.79	111.29	263.17	4724.25	606.58		975.00	1025.00	
@ Br. No. 05594	1.607	100 year Floodwa	229.94	0.00	232.79	111.29	263.17	4724.25	606.58	956.00	975.00	1025.00	1200.00
@ Br. No. 05594	1.539	100 year	228.57		229.07	517.87	181.21	3961.91	1450.87		956.00	1064.00	
@ Br. No. 05594	1.539	100 year Floodwa	228.77	0.20	229.27	300.00	65.95	4031.84	1496.21	950.00	956.00	1064.00	1250.00
@ Br. No. 05594	1.432	100 year	226.55		227.55	329.38	475.43	4648.79	469.78		957.00	1025.00	
@ Br. No. 05594	1.432	100 year Floodwa	226.74	0.19	227.80	150.00	177.26	4839.72	577.02	950.00	957.00	1025.00	1100.00

Reach	River Sta	Profile	Plan	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Adj (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
@ Br. No. 05594	1.873	100 year Floodwa	Floodway CORRECT	240.04	0.20	240.28	275.00	2855.08	2489.06	249.86	775.00	976.00	1025.00	1050.00
@ Br. No. 05594	1.873	100 year Floodwa	Floodway EFFECT	240.31	0.14	240.53	275.00	2916.03	2425.28	252.89	775.00	976.00	1025.00	1050.00
@ Br. No. 05594	1.82	100 year Floodwa	Floodway CORRECT	238.46	0.37	239.79	76.00	217.66	4902.06	474.28	964.00	975.00	1020.00	1040.00
@ Br. No. 05594	1.82	100 year Floodwa	Floodway EFFECT	238.88	0.23	240.10	76.00	226.93	4874.61	482.45	964.00	975.00	1020.00	1040.00
@ Br. No. 05594	1.761	100 year Floodwa	Floodway CORRECT	237.87	0.33	238.83	100.00	128.95	5143.44	321.61	1040.00	1050.00	1120.00	1140.00
@ Br. No. 05594	1.761	100 year Floodwa	Floodway EFFECT	238.44	-0.03	239.27	100.00	140.29	5105.93	347.78	1040.00	1050.00	1120.00	1140.00
@ Br. No. 05594	1.751	100 year Floodwa	Floodway CORRECT	237.86	0.40	238.69	109.13	205.31	5258.29	130.41	1040.00	1063.00	1140.00	1150.00
@ Br. No. 05594	1.751	100 year Floodwa	Floodway EFFECT	238.44	0.02	239.15	109.17	241.06	5213.36	139.58	1040.00	1063.00	1140.00	1150.00
@ Br. No. 05594	1.742	100 year Floodwa	Floodway CORRECT	237.56	0.50	238.57	97.04	191.54	5292.60	109.86	1100.00	1118.00	1188.00	1198.00
@ Br. No. 05594	1.742	100 year Floodwa	Floodway EFFECT	238.20	-0.10	239.06	97.09	227.97	5242.16	123.87	1100.00	1118.00	1188.00	1198.00
@ Br. No. 05594	1.733	100 year Floodwa	Floodway CORRECT	237.21	0.27	238.38	79.27	500.75	5067.64	25.61	1960.00	1970.00	2027.00	2050.00
@ Br. No. 05594	1.733	100 year Floodwa	Floodway EFFECT	237.86	-0.11	238.90	83.65	495.32	5074.58	24.10	1960.00	1970.00	2027.00	2050.00
@ Br. No. 05594	1.720	100 year Floodwa	Floodway CORRECT	237.30	0.36	238.11	76.96		5594.00			961.52	1038.48	
@ Br. No. 05594	1.719	100 year Floodwa	Floodway EFFECT	238.12	0.00	238.54	971.74	530.73	5002.95	60.32		962.50	1037.50	
@ Br. No. 05594	1.715 BR U	100 year Floodwa	Floodway CORRECT	237.30	0.36	238.11		329.28	4258.06	1009.06		961.52	1038.48	
@ Br. No. 05594	1.715 BR U	100 year Floodwa	Floodway EFFECT	238.12	0.00	238.54	462.32	1.61	5111.39	480.98		962.50	1037.50	
@ Br. No. 05594	1.715 BR D	100 year Floodwa	Floodway CORRECT	237.30	0.36	238.05	188.53	329.28	4258.06	1009.06		961.52	1038.48	
@ Br. No. 05594	1.715 BR D	100 year Floodwa	Floodway EFFECT	238.12	0.00	238.48	462.32	1.61	5111.39	480.98		962.50	1037.50	
@ Br. No. 05594	1.711	100 year Floodwa	Floodway EFFECT	236.74	0.00	237.48	75.00		5594.00			962.50	1037.50	
@ Br. No. 05594	1.710	100 year Floodwa	Floodway CORRECT	236.63	0.52	237.61	76.96		5594.00			961.52	1038.48	
@ Br. No. 05594	1.704	100 year Floodwa	Floodway EFFECT	233.22	0.00	236.64	61.17	619.60	4958.49	15.91		981.00	1024.00	
@ Br. No. 05594	1.702	100 year Floodwa	Floodway CORRECT	233.14	-0.10	236.69	53.00	3.78	5582.69	7.53	971.00	971.50	1023.20	1024.00
@ Br. No. 05594	1.664	100 year Floodwa	Floodway CORRECT	233.72	0.07	234.01	450.00	665.79	2336.16	2592.05	900.00	980.00	1020.00	1350.00
@ Br. No. 05594	1.664	100 year Floodwa	Floodway EFFECT	233.72	0.07	234.01	450.00	665.79	2336.16	2592.05	900.00	980.00	1020.00	1350.00
@ Br. No. 05594	1.607	100 year Floodwa	Floodway CORRECT	229.94	0.00	232.79	111.29	263.17	4724.25	606.58	956.00	975.00	1025.00	1200.00
@ Br. No. 05594	1.607	100 year Floodwa	Floodway EFFECT	229.94	0.00	232.79	111.29	263.17	4724.25	606.58	956.00	975.00	1025.00	1200.00
@ Br. No. 05594	1.538	100 year Floodwa	Floodway CORRECT	228.77	0.20	229.27	300.00	65.95	4031.84	1496.21	950.00	956.00	1064.00	1250.00
@ Br. No. 05594	1.539	100 year Floodwa	Floodway EFFECT	228.77	0.20	229.27	300.00	65.95	4031.84	1496.21	950.00	956.00	1064.00	1250.00
@ Br. No. 05594	1.492	100 year Floodwa	Floodway CORRECT	226.74	0.19	227.80	150.00	177.26	4839.72	577.02	950.00	957.00	1025.00	1100.00
@ Br. No. 05594	1.492	100 year Floodwa	Floodway EFFECT	226.74	0.19	227.80	150.00	177.26	4839.72	577.02	950.00	957.00	1025.00	1100.00

MAP REFERENCE NOTES:

1. SITE PLAN, BROAD DEVELOPMENT GROUP OF BRISTOL, LLC, 531 & 535 BROAD STREET, BRISTOL, CT, AUGUST 25, 2002 REVISED THROUGH NOVEMBER 8, 2005, ROBERT D. TROTTER, P.E. CT NO. 21295.

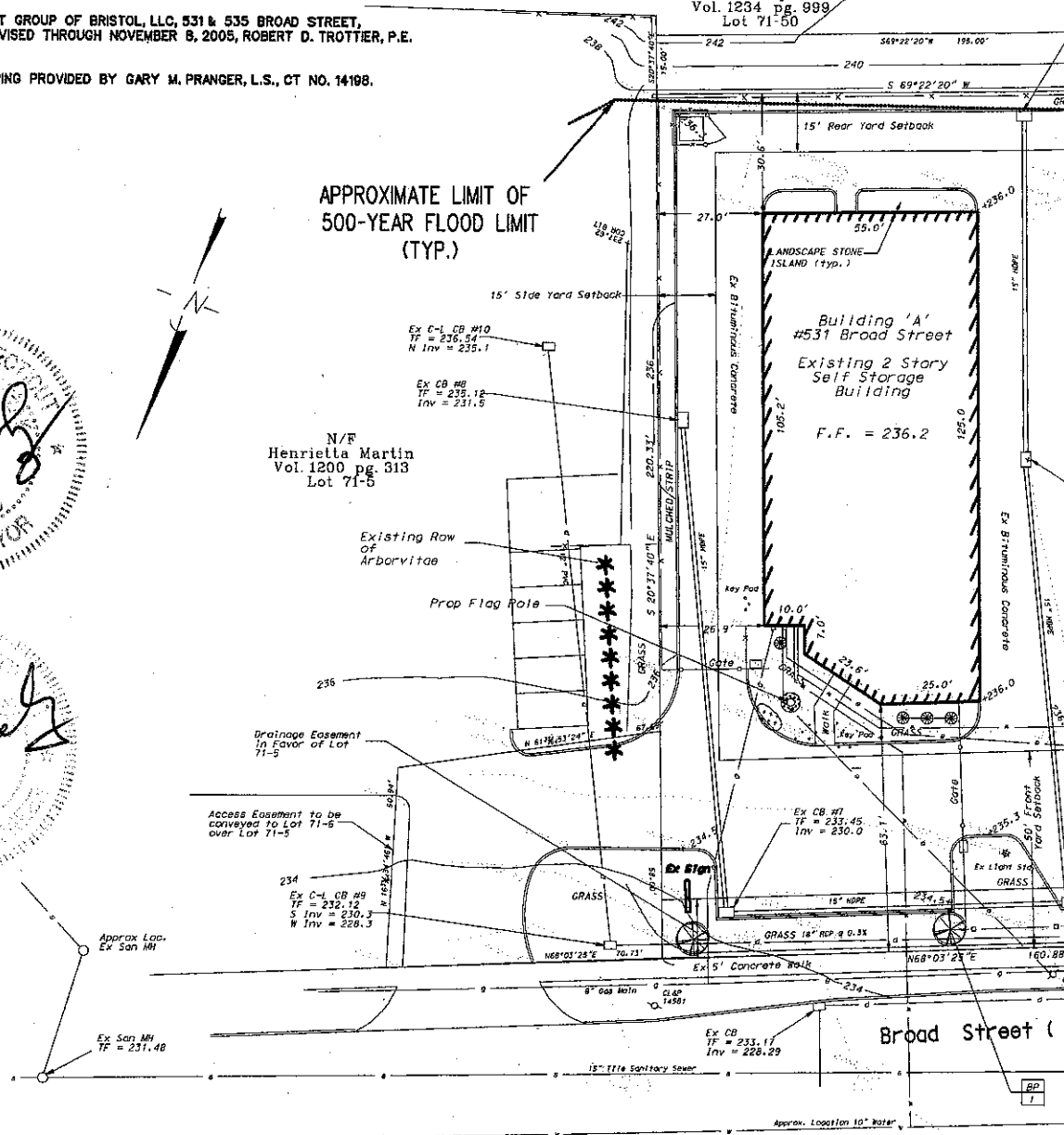
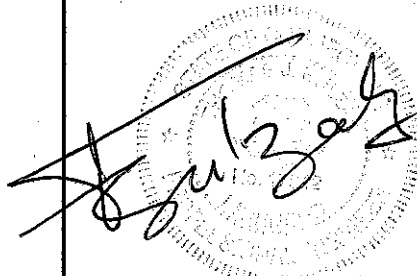
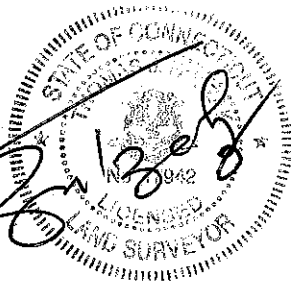
2. FIELD SURVEY DATA AND MAPPING PROVIDED BY GARY M. PRANGER, L.S., CT NO. 14198.

N/F
RGD Realty, LLC
Vol. 1234 pg. 999
Lot 71-50

APPROXIMATE LIMIT OF
500-YEAR FLOOD LIMIT
(TYP.)

N/F
Henrietta Martin
Vol. 1200 pg. 313
Lot 71-5

Building 'A'
#531 Broad Street
Existing 2 Story
Self Storage
Building
F.F. = 236.2



CERTIFICATIONS:

SURVEY CERTIFICATION:

- THIS FEMA FLOODPLAIN STUDY BASE MAP IS A TOPOGRAPHIC SURVEY AND HAS BEEN PREPARED IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20-300B-1 THROUGH 20-300B-20, AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 28, 1998.
 - CONTOURS CONFORM TO CLASS T-3 ACCURACY. VERTICAL CONTROL CONFORMS TO CLASS V-2 ACCURACY. HORIZONTAL CONTROL CONFORMS TO CLASS A-2 ACCURACY.
 - ELEVATIONS ARE REFERENCED TO NGVD 29. COORDINATES TO THE CT. STATE PLANE COORDINATE SYSTEM (NAD 27).
 - THE PURPOSE OF THIS MAP IS TO DEPICT THE PORTION OF PEQUABUCK RIVER THAT WAS STUDIED FOR A FEMA MAP REVISION.
- TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.
(NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL)

ENGINEERING CERTIFICATION:

- FLOOD PLAIN ELEVATIONS AND PROPOSED FLOODWAY LOCATIONS FOR PEQUABUCK RIVER REFLECT THE RESULTS OF A DETAILED ENGINEERING STUDY TITLED "531 BROAD STREET, BRISTOL, CONNECTICUT, PEQUABUCK RIVER HYDRAULICS STUDY" BY ECODSIGN, LLC, DATED JANUARY 18, 2008.
- TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON
(NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL)

REV.	DATE	REVISIONS DESCRIPTION

SCALE IN FEET
0 20 40
SCALE 1" = 20'

DESIGNER: T.J.B.
DRAFTER: R.C.B.
CHECKED BY: T.J.B.
DATE CHECKED: January 18, 2008

EcoDesign
CONSULTING ENGINEERING &
Avon, Connecticut 06001
(860) 677-4556